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THESIS

U.S. NATIONAL INTEREST AND TECHNOLOGY TRANSFER POLICY: THEY MUST BE UNITED

by

Nicholas Albert Trongale

September 1986

Thesis Advisor: Robert E. Looney

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technology, first from the initial incorporation, and second, from the advantages associated with transferring those goods to a Third World client.

The research substantiates all but hypothesis four.

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U.S. National Interest and Technology Transfer Policy: They Must Be United

by

Nicholas Albert Trongale
Lieutenant, United States Navy
B.A., Rosary College, 1978

Submitted in partial fulfillment of the
requirements for the degree of

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from the

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September 1986

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The purpose of this study is to define the American national interest in such a way that it can be used by decision-makers when formulating technology transfer policy, and to determine the significance of East-West technology transfer to American security.

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The research substantiates all but hypothesis four.

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I. INTRODUCTION

This thesis is concerned with technology transfer and the American national interest. How can America's technology transfer policy be made consistent with the national interest?

The American national interest today is a process of historic evolution. It is partly composed of unchanging core values deep-rooted in the words of our founding fathers. The unchanging side of the national interest had survived a devastating civil war, two world wars, one police action and a major conflict in southeast Asia. On the other hand, these same historic events greatly contributed to the evolutionary change of the national interest. The meaning of Life, Liberty, and the Pursuit of Happiness as expressed in our Declaration of Independence has changed over the years, but the true essence of those words is as much a part of the great American heritage today as it was two hundred years ago. The core values as expressed in the Declaration of Independence, Constitution, Bill of Rights and the 10th Federalist Papers have bent, but they have not broken. Even America a short time ago, torn by Vietnam, has regrouped under the Reagan Administration, and is again willing and able to defend the national interest.

The question often arises, just what is the American national interest? Can it be operationalized, and if so what are the implications for East West technology transfer? These are important questions that should be addressed. So many Americans have made the ultimate sacrifice to defend the national interest. Truly it must be a great thing, for men who cherish life as much as Americans do, to defend it to the death. This is why it is imperative that American policy-makers have in their minds a definition of the national interest when they are making decisions, including decisions concerning technology transfer.

Chapter II of this study will address the question, what is the national interest and what policies are appropriate in pursuing the national interest?

The question of technology transfer is put into perspective in Chapters III, IV and V. The hypothesis; how one views the Soviet Union directly affects one's perceptions towards the imperativeness of the linkage between technology and U.S. security, is explored in Chapter III. Chapter IV examines the second hypothesis; technology is a vital element in U.S. national security.

Intuition would dictate that the Soviet Union takes great pains in acquiring Western technology. The exigent question is, how much do they benefit from the technology they receive, and even more pressing, how does Western technology impact the Soviet Defense Industry? This

intuitive reasoning leads to the third hypothesis; the Soviet Union greatly benefits from the Western technology it receives either overtly or through illegal means. The third hypothesis will be addressed in Chapter V along with the fourth hypothesis; Western technology positively impacts Soviet economic growth.

The fifth hypothesis interrelates with the third in that it assumes that the Soviet Union greatly benefits from acquired Western technology. Chapter VII will focus on the hypothesis; the Soviet Union benefits twice from acquired Western technology, first from the initial incorporation, and second, from the advantages associated with transferring those goods to a Third World client. It is logical to assume that after Western technology is assimilated into the Soviet defense industry, it makes its way into the Third World through arms exports. If this is a valid theory, and one assumes that the Soviet Union benefits from arms export to the Third World, then the next logical questions are: how much does Western technology impact Soviet arms exports to the Third World, is this impact positive, and if yes, is it consequential to the United States? Chapter VI will cynosure Third World arms trade and arms industry as a background to Chapter VII.

Chapter VIII will explore the notion of technology as a strategy, along with possible benefits Eastern technology

might have for the West, and whether or not it could be used in a grand technological strategy.

This study is written under the assumption that there is a conflict between defense and social spending issues and foreign and domestic policy, and that both policies are vital to America's interests, but even more important is the defense of the nation against the evergrowing Soviet threat. The greater controversy lies in the question, how much defense is enough?

There is, at times, a conflict between the national interest and foreign policy decisions made under the guise of the national interest for security reasons. Also the fact that some politicians pawn off decisions in the name of the national interest when in actuality they are in the best interest of their party or their constituency. This will be taken into account when addressing the issues.

The purpose of this study is to define the American national interest in a way that it can be used by decision-makers when formulating technology transfer policy, and to focus attention on the importance of technology to American security and how that same technology governed by no strategy or a poor strategy can adversely impact American security.

II. THE NATIONAL INTEREST

Defining the American national interest is not a simple task. Anyone who has researched the subject was more than likely surprised given the importance of the subject at the lack of scholarly work available.

If one assumes the hypothesis that U.S. foreign policy is based on the national interest, the significance of having a theoretical if not working (operational) definition of the national interest is paramount for all policy makers.[1] It is from this perspective that the subject is pursued.

The difficulty in defining the national interest lies in the fact that the national interest is an intuitive concept rooted in subjective, non quantifiable values.[2] It is for this very reason that analysts find it most difficult to operationalize the concept. As a concept, national interest is used in both political analysis and political action. The national interest as an analytic tool is employed to describe, explain, or evaluate the sources, or the adequacy of a nation's foreign policy. As an instrument of

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[1]Joseph C. Menendez, Influence: U.S. National Interests and the Republic of the Philippines, p. 13, Master's Thesis, Naval Postgraduate School: Monterey, California, December 1981.

[2]James N. Rosenau, "National Interest," p. 34, as presented in the Encyclopedia of Social Sciences.

"political action" it serves as a means of justifying, denouncing, or proposing policies. Either as an analytic tool or as an instrument of political action the emphasis is on what is good for the nation. In regard to policy-makers this usually means what is the best national interest as far as foreign policy decisions are concerned.[3] This is a Catch 22. It assumes that American policy-makers have a working definition of the national interest. It also assumes that all foreign policy decisions uphold the values that America stands for. Or do they?

Take for example the case of the U.S. supporting its long and faithful ally, Marcos. It was in the best national interest to maintain friendly relations with the president of the nation that houses the United States' two largest military bases outside the states proper, even if some of Marcos' actions were not in keeping with the finest traditions of freedom and democracy. A more recent example of a clash between U.S. ideology and foreign policy can be seen by the Reagan Administration's refusal to take a hardline stance against the South African government. The administration feels that it is best serving the national interests by not shutting the door on the Botha regime even when faced with strong opposition by both liberal and conservative elements within the United States.

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[3]J.N. Rosenau, "National Interest," p. 34.

The ultimate challenge for policy-makers at the present and in the future lie in creating policy that in the past have adhered to and served the national interest as it is traditionally defined, and bringing it into harmonic balance with the human interest of eliminating war and poverty, promoting human rights and halting ecological decay.[4] Viewing this problematically, they can be stated in regard to order values. For Robert Johansen these include: unilateral disarmament (eliminating a need for armies), economic well-being for all, universal human rights and social justice, and ecological balance. When one views this on a world scale, the complexity and controversial nature of the problem confronting the policy-maker illuminates. The difficulty of the problem in no way excuses the policy-maker from doing what is right for the nation as a whole.

Hans Morgenthau, on the other hand, emphasized that the "objectives of a foreign policy must be defined in terms of the national interest." According to him, "the kind of interest determining political action in a particular period of history depends upon the political and cultural context within which policy is formulated."[5] The national interest for Morgenthau is one guiding star to follow, one standard

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[4]Robert C. Johansen, The National Interest and the Human Interest, p. 20, Princeton University Press, 1980.

[5]J.N. Rosenau, "National Interest," p. 35.

of thought, and one rule of action.[6] This indicates at least that the national interest is changing over time, but is there a hierarchy to it?

In a study by Maynes, Yankelovich, and Cohen, there are eight reoccurring themes in defining the national interest.[7] They were:

1. a strong defense posture
2 commitment to core allies
3. pursuit of detente
4. good relations with the PRC
5. commitment to Israel
6. American leadership in world affairs
7. involvement in international foreign policy solutions
8. coherent energy policies.

Joseph Menendez' thesis at the Naval Postgraduate School questions whether these are in fact independent interests or instrumental goals, that is, a goal that leads to the attainment of a higher or more important goal. For example, is not commitment to core allies an instrumental goal of a strong defense posture?[8] The above mentioned study by Maynes, Yankelovich, and Cohen was written in 1976. A more current study might yield different results. Perhaps the

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[6]J.N. Rosenau, "National Interest," p. 35.

[7]J.C. Menendez, Influence: U.S. National Interest and the Republic of the Philippines, p. 19.

[8]J.C. Menendez, Influence: U.S. National Interest and the Republic of the Philippines, p. 19.

pursuit of detente and possibly a coherent energy policy would be left off a list compiled today. They may be replaced by the need to balance the budget.

A. A HISTORY OF THE CONCEPT NATIONAL INTEREST

As stated earlier, the national interest is an instrument of action and a tool of analysis. Historians, in tracing the concept back to its beginnings find a much longer history of the national interest as an instrument of action. Political entities formulated policy based on the national interest dating as early as the sixteenth century in Italy and the seventeenth century in England. Claims were made in the name of the "will of the prince," "dynastic interests" and other such phrases. As nationalism began to rise, and the concept of the divine rights of kings diminished, new phraseology such as the "national honor," the "public interest," and the "general will" began to emerge as replacements.[9]

In America, since the conception of the Constitution, statesmen utilized the term national interest. It was not until the nineteen hundreds, and because of World War I and World War II, that policy-makers fully realized the impact the mass public had in formulating foreign policy. Since that point the term "national interest" became a tool in which analysts could describe, explain, and assess the

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[9]J.N. Rosenau, "National Interest," p. 35.

foreign policies of the nation. This same time period also saw the concept national interest being distinguished from the term "public interest," which has come to be used in regard to the domestic policies of America.[10]

B. THE NATIONAL INTEREST AS AN ANALYTIC TOOL

1. The Objectivists

Since the advent of the national interest as an analytic tool there have been many theories of what the national interest is and how to operationalize the concept. The objectivists formulated one such theory based upon observations made during World War II and the events leading up to it. The objectivists believe that the best interest of the nation is a matter of objective reality. To know and describe reality will enable policy-makers to use the concept of the national interest "as a basis for evaluating the appropriateness of the policies which a nation pursues."[11] The limitations of this theory lie in that their inquiries do not rest upon a methodological and philosophical foundation, and that they believe correspondence between their descriptions and the objective situation is self-evident. For this reason they do not find it necessary to explain how or why their descriptions of the national

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[10]J.N. Rosenau, "National Interest," p. 35.

[11]J.N. Rosenau, "National Interest," p. 35.

interest are in accord with reality.[12] In short, the objectivists believe that each state has an objective national interest.

2. The Subjectivists

A less scientific and more difficult approach to operationalizing the national interest is the method of the subjectivists. The objectivists were concerned with the worth of foreign policies. On the contrary, the subjectivists focus on explaining why nations act in the manner they do in the international arena. Intriguing to them was the role the national interest played in explaining the actions of a nation state. They concluded that a nation naturally acts with its best interest in mind in order to satisfy certain needs and wants. If they can identify these needs and wants, they, as analysts, would be able to use the concept of the national interest as a tool of analysis. For the subjectivists, "national interest is not a singular objective truth that prevails whether or not it is perceived by the members of a nation, but it is, rather, a pluralistic set of subjective preferences that change whenever the requirements and aspirations of the nation's members change."[13] Furniss and Snyder put it this way, "The national interest is what the nation, i.e., the decision

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[12]J.N. Rosenau, "National Interest," p. 35

[13]J.N. Rosenau, "National Interest," p. 35.

maker decides it is."[14] The definite shortcoming to this approach is the difficulty in identifying the needs and wants of a nation, along with the fact that interpretation of a society's values are left up to the decision-maker. There of course will also be special interest groups voicing opinions that influence policy-makers.

Donald Nuechterlein fits in this group. His theory is based on the premise that political scientists should attempt to more accurately define the goals, objectives, and drives of nation-states in the international system.[15] The concept national interest should be resurrected to the stature it rightfully deserves. Nuechterlein's objective is to define the national interest in such a way that it can be used as a viable analytic tool in which statesmen can better assess how other states view their national interests, and in particular their vital interests for the purpose of more accurately projecting the kinds of policies and actions likely to be employed when those interests are challenged.[16] His first step is to derive universal definitions regarding the goals of states. This is a prerequisite to explaining state behavior. An obstacle along the way for Nuechterlein

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[14]J.N. Rosenau, "National Interest," p. 35.

[15]Donald E. Nuechterlein, National Interest and Presidential Leadership: The Setting of Priorities, p. xiii, Westview Press, Colorado, 1978.

[16]D.E. Nuechterlein, National Interest and Presidential Leadership: The Setting of Priorities, p. xvi.

is the theoretical opposition presented by the objectivists or as Nuechterlein prefers to refer to them as the "realist" school of thought led by Hans Morgenthau, George Kennen, "and the disciples of the realist cult."[17] Their theory does not account for "public opinion" and its impact on foreign policy. The president and a handful of advisors make all the decisions. In comparison, Nuechterlein defines the national interest as the "perceived needs and desires of one sovereign state in relation to the sovereign states comprising its external environment."[18] He clearly makes a distinction between external and internal environment. The internal environment of the nation refers to the public interest whereas the external environment of the nation refers to the national interest, much in the same way James Rosenau views the split. Further, the national interest for Nuechterlein is the interest of the whole, i.e., not of any one interest group or bureaucratic entity, or political group within the state. Although, he does not downplay the importance of the interest group or the bureaucratic mechanism of the state in regard to the role they play in formulating the national interest.

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[17]D.E. Nuechterlein, National Interest and Presidential Leadership: The Setting of Priorities, p. 2.

[18]D.E. Nuechterlein, National Interest and Presidential Leadership: The Setting of Priorities, p. 3.

3. Basic National Interests

In order to operationalize his theory, Nuechterlein derived a set of definitions for the basic interests of a nation, or its national needs.[19] They are as follows:

1. Defense interests: the protection of the nation state (defense of homeland) and its citizens against the threat of physical violence directed from another state or against an externally inspired threat to its system of government.

2. Economic interests: the enhancement of the nation-state's economic well-being in relations with other states.

3. World order interests: the maintenance of an international political and economic system in which its citizens and commerce may operate peacefully outside its borders.

4. Ideological interests: the protection and furtherance set of values that the citizens of a nation-state share and believe to be universally good.

4. Intensities of Interest

In order to further enhance his ability to operationalize the national interest, Nuechterlein derived varying degrees or intensities of interest.[20] They are:

1. Survival issues: when the very existence of nation-state is in jeopardy, as a result of overt military attack on its own territory, or the threat of attack if an enemy's demands are rejected.

2. Vital issues: when serious harm will very likely result to the state unless strong measures, including the use of conventional military forces, are employed to counter an adverse action by another state or to deter it from undertaking a serious provocation.

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[19]D.E. Nuechterlein, National Interest and Presidential Leadership: The Setting of Priorities, p. 4.

[20]D.E. Nuechterlein, National Interest and Presidential Leadership: The Setting of Priorities, p. 8.

3. Major issues: when a state's political, economic, and ideological well-being may be adversely affected by events and trends in the international environment and thus requires corrective action in order to prevent them from becoming serious threats (vital interests).

4. Peripheral issues: when a state's well-being is not adversely affected by events or trends abroad, but when the interests of private citizens and companies operating in other countries might be endangered.

How does Nuechterlein use his basic interests and his intensity of interests to operationalize the national interest?

Nuechterlein created a matrix that allows the analyst to assess what policies decision-makers should pursue. This matrix identifies the national interest of a nation-state by comparing the intensity of interest, whether it be survival, vital, major, or peripheral, with the basic interest at stake like defense economic favorable or ideological. This example will better explain how the matrix works.[21]

Country: US Issue: Vietnam, 1965

Basic interest at stake	Intensity of interest			
	Survival	Vital	Major	Peripheral
Defense of homeland				X
Economic well-being				X
Favorable world order		X		
Ideological			X	

[21]D.E. Nuechterlein, National Interest and Presidential Leadership: The Setting of Priorities, p. 88.

According to Nuechterlein, "An important conclusion should be drawn from this. Namely, the United States ought to have more than one of its basic national interests rooted at the vital level before its leaders contemplate using military force outside North America again."[22]

Nuechterlein may be the closest subjectivist to derive an operational definition of the national interest, but he still comes up short. Like other subjectivist theorists, Nuechterlein tried to make a complex subject simple but failed. His theory has its foundations entrenched in assumptions. It does not take into account the various values that make up the national interest, or their changing nature. He failed to fully recognize the significance of the special interest groups, and their importance to the national interest.

As a tool of analysis the national interest has not been all that successful. This can be attested to by the immense deficiencies of the mentioned theories. The utility value of the national interest as an analytic tool is even lessened further by the increase of world interdependence. The new kids on the block are the West, the East, the Arab world and so on. Policy-makers are making decisions in terms of enhancing these supranational entities. This is not to say that the national interest is dying. Nationalism

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[22]D.E. Nuechterlein, National Interest and Presidential Leadership: The Setting of Priorities, p. 95.

is still very strong and will be around for a long time. The national interest's future lies in its use in politics. It is as an analytic tool that it is dying.[23]

C. THE VALUE-LADEN CHARACTER OF THE NATIONAL INTEREST

If one concludes that the national interest is rooted in values, it is imperative to have a working knowledge of what those values are. The thought process of the policy-maker is inadequate without it. There are several indicators of the priorities that make up the national interest. Some of these are the national budget, politics and literature, and presidential leadership. This paper will briefly examine each.

1. The Budget

"The budget is the single greatest indicator of the threat facing the national interest."[24] During the budgetary process the nation allocates its fiscal and national resources for the purpose of obtaining the goals set by the national security policy.

The budgetary process used today by the Planning, Programming, and Budget System (PPBS) is based upon a strategy developed to counter an anticipated threat. Force requirements are then established based on the strategy.

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[23]J.N. Rosenau, "National Interest," p. 39.

[24]Quote taken from a lecture of Dr. Frank Teti, Professor of National Security Affairs, Naval Postgraduate School, 1985.

From those force requirements come manning requirements and weapon systems. Finally, budgetary allocations support the derived requirements of manning and weapon systems research and development (R&D). PPBS usually interfaces between military strategy and specific defense programs.

The nature of a threat is determined by threat analysis. Threat analysis infers the ability to accurately determine that one nation or group of nations are potentially dangerous to another. This statement insinuates that the political, economic, and military goals of the threat nation are in conflict with, for our purpose, the United States. Also, that the threat nation(s) possess equal or greater power and have the ability and potential will to use it. The nature of the threat has visibly changed over the past twenty years. During the period of detente the United States' national priorities changed significantly. The percentage increase for civilian programs such as human resource programs--health, income maintenance, education, manpower, housing, and community development, has increased greatly as compared to that for national defense.[25] The Soviet invasion of Afghanistan renewed the awareness of the dangerous nature of the threat. This is evident in how the "pie" has been cut since President Carter's last budget.

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[25]Robert P. Mayo, "Budgetary Considerations," p. 5, as presented in National Priorities, M.B. Schnapper, editor; (Public Affairs Press, 1969).

The point is that it is American values that interpret the threat.

2. Presidential Leadership

The Office of the President of the United States is the most powerful political position in the world. It is for this reason that presidential leadership is so important to the decision-making process, i.e., the process based upon the interpretation of values that formulate the national interest. A charismatic and effective leader can influence the decision-making process like no other individual or group. During times of crisis this influence is amplified and the American people tend to rally around the president in added numbers.

By following the Office of the President, one can view the pulse of the nation's values at any given time. The president is the leader of the nation, and like all leaders of any organization, sets the tone for the organization. He is the most important policy-maker, but, despite the vast power the president possesses, he is still accountable to the will of the people and to the system he presides over. This system is commonly referred to as the MADISONIAN MODEL.[26]

The best way to describe the concept of the Madisonian model is to say it is a model that displays the moderate tradition of American politics, and the American policy

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[26]See the 10th Federalist Papers.

making process. The essence of the Madisonian model is the combination of numerous elements and inputs. It is the model of the compromise consensus cycle of American politics. Its most general element is majority rule, but it allows for various special interest groups to have an input in the political process.

The Madisonian model receives its strength from the fact that each player has an input into the political process, and every player has the potential to win. The model allows for change but always maintains a moderate position. This produces a sense of political stability because all major decisions tend to gravitate towards the center.

The Madisonian model explains some of the constraints placed upon the office of the presidency but it does not diminish the utility of studying the policies of the office in order to gain an understanding of just what American values are. If anything the Madisonian model enhances the usefulness of presidentology for that purpose. Two very good examples of what American values are can be seen in the national interest as expressed in the Reagan doctrine and the State of the Union Address.

3. The Reagan Doctrine

The Reagan Doctrine is very explicit in regard to its meaning. President Reagan, in the State of the Union, February 1985 stated, "We must not break faith with those who are risking their lives on every continent from

Afghanistan to Nicaragua to defy Soviet-supported aggression and secure rights which have been ours from birth . . . . Support for freedom fighters is self-defense." President Reagan reiterated those words in 1986, "To those imprisoned in regimes held captive, to those beaten for daring to fight for freedom and democracy--for their right to warship, to speak, to live and prosper in the family of free nations--we say to you tonight: You are not alone freedom fighters. America will support with moral and material assistance your right not just to fight and die for freedom, but to fight and win freedom--to win freedom in Afghanistan, Angola, Cambodia and Nicaragua." These words are an indicator that support of freedom fighters and the promotion of democracy are part of the American national interest. The Reagan Doctrine pulls its strength from the American revolutionary heritage that is supported in the U.S. Constitution, along with the fact that the United States is the world democratic leader. Fascinating is the fact that the Reagan Doctrine supports not the status quo but revolution.[27]

The State of the Union Address is an outstanding indication for determining the priorities within the national interest. In the 1986 State of the Union Address, President Reagan made it clear just what was the nation's number one priority. He stated that, "Defense is not just

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[27]Charles Krauthammer, "The Reagan Doctrine," Time Magazine, p. 54, 1 April, 1985.

another budget expense. Keeping America strong, free, and at peace is solely the responsibility of the federal government; it is government's prime responsibility." He left no room for questions as to just what the threat was either. "We have denoted five years trying to narrow a dangerous gap born of illusion and neglect. And we've made important gains. Yet the threat from Soviet forces, conventional and strategic, from the Soviet drive for domination, from the increase in espionage and state terror remains great. This is reality. Closing our eyes will not make reality disappear."

4. Politics and Literature

Henry F. May in his book, The End of American Innocence, places great emphasis on politics and literature. They are, "the most important and revealing means of American self-expression."[28] Politics, literature, art, and cinema are all direct indicators of the values of the time. May uses examples from literature and politics to explain a phenomenon that took place in America. He believes that no one will deny that sometime in the twentieth century, America went through a cultural revolution. The cultural revolution May is talking about took place in 1917. It was, as May put it, "the End of American Innocence." It was the end of the American credo of moralism, progress, and a

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[28]Henry F. May, The End of American Innocence, p. xiii, Alfred A. Knopf, Inc., 1959.

belief in culture. The first world war was not the cause of the revolution. The seed was already planted by a successful internal assault on American Innocence that started in 1912, and by external forces that influenced the revolution. These external forces include the scientific, philosophical, and social influences that primarily came from Europe beginning in the nineteenth century, such as the writings of Freud and Hume, Darwin's Theory of Evolution, and Einstein's Theory of Relativity.[29]

May's theory of the utility value of expression is evident by the literature, movies, and art of the Vietnam era. This was a very turbulent time in American history. There were direct and almost treasonous acts by anti-war protestors. The anti-establishment, anti-war theme was very prevalent during this period. The after-shock of the war was felt for years in themes about anti-heroes leading fights against the establishment.

One such anti-hero was Billy Jack, a Vietnam vet who was ex-special forces and an expert in karate. All Billy Jack wanted to do was live his life in seclusion, free from outside interference. But he could not turn his back on those people being oppressed by both the establishment (the politicians, police, and military), and the anti-establishment (degenerates such as the Hell's Angels). The Billy Jack theme typified a quest for a happier time when there

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[29]H.F. May, The End of American Innocence, pp. 219-248.

was a distinction between good and evil, and right and wrong. Billy Jack was the John Wayne of the Vietnam generation.

The follies of war theme was common during this period. This did not necessarily mean that literature or the cinema had a direct Vietnam war theme. For example, the movie M*A*S*H was set during the Korean war period. It did, although, have an overwhelming Vietnam flavor. How often does one think of Korean war era soldiers sitting around indulging in drugs?

D. AN OPERATIONAL DEFINITION OF THE NATIONAL INTEREST

The search for an operational definition of the national interest can be compared with the quest for utopia. If a survey was taken of individual perceptions of utopia, it is dubious that there will be any two definitions that are exactly alike. Although, there would more than likely be a common theme or set of themes present in all of the definitions. This common denominator can be a useful tool in helping one operationalize the national interest. However, some theorists do warn against defining the national interest in terms of an underlying common denominator, because it narrows the definition of the concept.[30] This may be true but, as long as one's knowledge of the concept is not

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[30]Friedrich Kratochwil, "On the Notion of Interest in International Relations," International Organization 36 (winter 1982): 1-30.

narrowed there is no harm done. There is a difference between a narrowed definition that enhances its utility and a narrow knowledge of the concept that serves no useful purpose at all. The theoretical knowledge of the national interest must come first before the operational knowledge of the concept.

A grand attempt at providing an operational definition of the American national interest can be seen in an article entitled, "The Quest for an Operational Definition of the National Interest."[31] The author's thesis is that the utility value of the concept national interest has been minimized due to a lack of articulation in providing the needed direction, coordination, commitment, and legitimacy. Once these elements can be articulated, the national interest can then assume its role as the standard by which public actions can be evaluated.[32]

The author identifies three component elements of the national interest. They are:

1. The historical-cultural foundation: is a body of experience and political-legal structure which fluents a particular notion of reality. The author, through what he calls a "sociology of knowledge model," attempts to show a hierarchical linkage between individual thought, social thought, and action. At the heart of this knowledge attitudes and aspirations which in turn influence the frames of reference of political perceptions. These perceptions ultimately

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[31]Frank M. Teti, "The Quest for an Operational Definition of the National Interest," an unpublished article.

[32]F.M. Teti, "The Quest for an Operational Definition of the National Interest."

determine political actions. Three systems of thought arise from the answering of the core metaphysical question of the nature of man; the materialistic, the idealistic, and the pluralistic systems of thought.

2. The problematic or situational context: refers to the specific problems which pressure society to think and/or act. These refer to the real-world demands of society that both initiate the decision-making process and provide the framework in which the context takes place.

3. The hierarchy of perceived or actual needs: the interaction of the first two elements produce these needs. How this interaction takes place depends on the specific political system involved. In a system with a pluralistic orientation such as America, the synthesis of diverse and variant opinions takes place within the context of the Madisonian model. "Diverse elements within the polity may pursue their interests no further than the bounds of possible compromise."[33] The author admits to certain shortcomings in his theory. A pluralistic society by its nature interprets historical experiences, cultural norms, priorities of action, and perceived needs differently. But, he perceives the problem not lying with the diversity of perceptions but rather that "at the present time there is no formal machinery for synthesizing diverse political knowledge into a national consensus."[34] If this can be accomplished it would free America from national policies that are developed basically on no more than demand of the moment.[35]

The above quest for an operational definition of the national interest includes such key elements as national needs and problematic correspondence, i.e., specific problems which pressure society to think and/or act. Others that are worthy of mention are legitimacy, realism versus

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[33]F.M. Teti, "The Quest for an Operational Definition of the National Interest."

[34]F.M. Teti, "The Quest for an Operational Definition of the National Interest."

[35]F.M. Teti, "The Quest for an Operational Definition of the National Interest."

idealism, and goals, values, ideologies, and the national identity. Each is important in its own right.

1. Legitimacy

Legitimacy is a concept paramount to any political decision. The same is true when speaking of the legitimacy of the national interest. The legitimacy of the national interest implies that it is in keeping with the principles and standards of the United States, remains within the boundaries of the Constitution, and has the support of the American people. Legitimacy is the key element of the national interest, without it the others lose meaning.

2. Realism vs. Idealism

A survey of the literature covering the spectrum of American history reveals a transformation between Idealism and Realism. May called it the End of American Innocence. It was not all that terrible, as May points out, "The End of American Innocence was part of a great tragedy, but it was not, in itself, an unmitigated disaster. Those who look at it with dismay, or those who deny that it happened, do so because they expect true stories to have a completely happy ending. This is a kind of innocence American history must get over."[36]

Walter Lippman also wrote about the transition between idealism to realism. He wrote about the first world war ending the greatest domestic reform movement in American

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[36]H.F. May, The End of American Innocence, p. 398.

history. The nineteen twenties was a period of retreat. It was a period in which an innocent culture transformed into a realist culture. People just wanted to be left alone. They had been tricked by the government who got them into the war that was supposed to end all wars and make the world safe for democracy. The immediate result was the roaring twenties, the most corrupt period in America. The attitude that the government can not be trusted, an attitude that developed during that period has become a part of American psyche. There have been periods when this attitude lay dormant, such as the second world war, the 1950's period of conformity, and the 1980's to date, the period of the resurrection of patriotism. No longer are decision-makers going to be allowed the luxury of acting as though this psyche does not exist.

The split between idealism and realism must be accounted for when formulating an operational definition of the national interest and when addressing the question of technology transfer.

3. Goals, Values, Ideologies, and the National Identity

President Reagan, in his last two state of the union addresses unequivocally stated that the primary goal of the federal government is defense. Also included as goals are support of freedom fighters and the promotion of world democracy. Democracy is part of the national identity as well as the American ideology. Support of these and other

values such as life, liberty, and the pursuit of happiness are in the American national interest. But these are not the only goals the president spoke of.

President Reagan spoke of the public interest as those goals and values that affect the internal policy of the nation. The national interest and the public interest are intertwined. The values that apply to the national interest apply to the public interest. Although the values are the same, the national interest and the public interest often come in conflict with each other. This happens most notably in the fight for the national budget.

4. The Public Interest

The concept "public interest" is as illusive as the national interest, but just as important to understand. The public interest affects the domestic policies of the nation. Ernest S. Griffith defines it as: "The concept of public interest may be broadly viewed, even to the extent of treating it as roughly synonymous with general welfare. Such a definition holds it capable of permeating all action, both individual and institutional."[37] Griffith believes there are certain public interest goals as expressed by the Christian ethical definition of the concept.[38] They are:

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[37]Ernest S. Griffith, "The Ethical Foundations of the Public Interest," p. 14, as presented in The Public Interest, Carl J. Friedrich, editor; (Princton-Hall Inc., 1962).

[38]E.S. Griffith, "The Ethical Foundations of the Public Interest," p. 21.

1. Freedom of religion.

2. Education for all to the limit of one's ability.

3. Freedom of speech and media of communication (within moral limits).

4. A standard of living that includes nourishment and pleasant homes.

5. Constructive work available for all who desire it.

Griffith makes a distinction between the goal expressed by the Christian ethical definition of the concept and the guidelines for "decision-makers including voters who seek to discover and act in the public interest."[39] They are:

1. Other things being equal, decisions should favor the consumer rather than the producer.

2. Other things being equal, decisions should favor the future generations rather than the present, long-term rather than short-term goals.

3. Other things being equal, freedom rather than coercion should be favored.

4. Decisions should assume a basic equality among individuals as "end" or as "children of God" in matters of rights and justice.

When considering the overall goals of America, there seems to be reoccurring themes that combine both national interest and public interest goals. This once again supports the theory that they are interrelated. Walter P. Reuther developed a liberal view on just what the goal for America should be, by defining it in terms of complete equality of opportunity based upon one's ability and

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[39]E.S. Griffith, "The Ethical Foundations of the Public Interest," p. 22.

regardless of race, sex, creed, social position or family wealth.[40] Reuther defined his goals in more materialistic terms:

1. Elimination of poverty from our society.
2. The opportunity for every person to obtain as much education as he is able and willing to absorb.
3. The opportunity for every person to make the fullest use of his native abilities and learned skills, and to be compensated accordingly.
4. The best possible health care for every person, regardless of his individual finances.
5. A good home in a decent neighborhood for every family.
6. Adequate recreational and cultural opportunities for every taste.
7. Clean air and pure water in every community.
8. A steadily rising standard of living for all.
9. A fair share of help for needier peoples.
10. An adequate national defense, physically capable of deterring aggression, but incorporated into a national policy of seeking security for America primarily through the establishment of security for all peoples through international agreement.

Reuther placed very high priority on the American dream. He acknowledged a need for defense but fails to place the importance on it that is necessary. An "adequate" defense equates to a dangerous and unstable world order. Besides, without a strong defense there will be no American dream.

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[40]W.P. Reuther, "Goals for America," p. 62.

For President Reagan, "The American Dream is a song of hope that rings through the night winter air. Vivid, tender music that warms our hearts when the least among us aspire to the greatest things--to venture a daring enterprise; to unearth new beauty in music, literature, and art; to discover a new universe inside a tiny silicon chip or a single human cell."[41]

E. SUMMARY/WHAT IS THE NATIONAL INTEREST?

For the purpose of the rest of this study an operational definition of the national interest will be that of an instrument of political action in that it is a means of justifying, denouncing, or proposing policies. Under the guise of national interests, policy-makers can, for the purpose of satisfying national needs as defined by problematic context, act in the best interest of the nation. They do so in a legitimate manner that results in complete democratic compliance. Democratic compliance (via due process) and legitimacy are the key elements of any successful foreign policy.

The American national interest is the protection of our perceived needs and desires, i.e., the national identity and core values that make up the essence of what American is. These include the Declaration of Independence, the Constitution, the Bill of Rights, and the 10th Federalist Papers.

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[41]The State of the Union Address, 1986.

In order to protect the national interest, America's number one goal must be a strong national defense. It is only from a strong strategic position that the United States can hope to negotiate other interests such as world peace, human rights and the spreading of world democracy and freedom. America's security is paramount to the pursuit of the American Dream. Therefore, the national interest should take priority over the public interest. Foreign and domestic policy should be formulated with defense in mind. A strong defense is key to obtaining both national and public interest goals.

The remainder of this thesis will be argued from the basis of this definition of the national interest and that America's number one goal should be to maintain a strong defense posture in order to pursue its national interests. Furthermore, any overt conflicts between defense and economic strength should be decided in favor of their relative contribution to national security.

III. TECHNOLOGY TRANSFER

The main objective of this section of this thesis is to explore a sample of various theories of technology transfer and their effects on the Soviet Union.

How these theories are formulated and how the theorist interprets them has a great deal to do with their individual mind-set, that is, the perspective one takes when addressing an issue. The question of mind-set will be explored in the first part of this section.

The question of technology transfer is as equally complex as that of the national interest. It differs in that there is an overabundance of information on the subject, and separating the wheat from the chaff is quite difficult.

One might ask the question, "how does technology transfer relate to the national interest?"

Technology is a key element of defense. It is a primary tool that is considered when developing American military strategy to be utilized in defending the nation. Therefore what the nation does with this technology is of major concern to the policy-maker who formulates foreign policy under the guise of the national interest. This is especially true when speaking about technology that is being transferred directly to the threat, the Soviet Union.

A. THE AMERICAN MIND-SET

How a policy-maker views a particular policy towards the Soviet Union depends upon his preconceived notions of the nature of the Soviet threat. Therefore, although two policy-makers may be looking at the same Soviet-related problem, they see different solutions. Charles Wolf attributes such prospective differences to "certain underlying beliefs or premises concerning the nature of the Soviet system and the principle objectives of its leadership." He calls these mind-sets "mirror-imaging" (MI) and "power-maximizing" (PM).[42] Wolf does admit this dichotomy is a bit oversimplified but, nevertheless, it serves as a useful tool in explaining how different policy-makers view technology transfer.

1. Mirror-imaging

Those who hold the mirror-imaging view of the Soviet Union, its system, and leadership, believe that Soviet aggressiveness, expansionist policy, and militaristic tendencies extend from Great Russian history and culture. That throughout Russian history they were extremely vulnerable to attack from outside invaders. They see a need for buffer territory in order to prevent any future invasion into the

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[42]Charles Wolf, Jr., "Soviet Economic Stringencies: External Reactions and Repercussions," a paper prepared for a symposium on "Soviet Economic Stringencies: Political and Security Implications," sponsored by the National Defense University and the Defense Intelligence College, Fort McNair, Washington, D.C., May 10-11, 1984.

motherland. This constant vulnerability over a number of centuries led to an inferiority complex that is present today. It is for these reasons that the Soviet expansionist policy exists. Ever since the birth of the Soviet Union in 1917 the Soviet ideology has been under attack from the West. This just increases Soviet mistrust of the United States and the West. And finally the lessons of the Great Patriotic War and the twenty million Soviet lives lost has taught the Soviets that they must maintain a strong defense. These are some of the reasons the Soviet Union is a garrison state.

Those who mirror-image say Ivan selling sausage on the street in Moscow is just like Charlie selling soft pretzels in Manhattan. They contest that if the United States is nice to them and show its good intentions, the Soviet Union will reciprocate. They believe that the long term goals of the Soviet Union is much like those of the United States, that is, "human betterment and well-being, social progress, peace, prosperity, and justice." That a policy of concessions combined with firmness will at worse produce a "symmetrical rather than exploitative response from the Soviet leadership, and perhaps also an irenic evolution of the Soviet system."[43] According to Wolf the holders of MI are likely to favor subsidies, increased trade, and various

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[43]C. Wolf, Jr., "Soviet Economic Stringencies: External Reactions and Repercussions," p. 5.

forms of credit. This was the whole precept behind detente in the seventies.

2. Power-maximizing

Those who hold the power-maximizing point of view believe that the worse the Soviet economy is the better it is for the West. The Soviet leadership will have to contend with a conflict of interest between the competing claims of the military establishment, domestic economy, and its outside interests, Eastern Europe, third world, etc. This conflict may force Soviet leaders into making changes that will be favorable to the West.[44]

Wolf argues that the power-maximizer views the Soviet Union as an ideological and military adversary of the West and that East-West economic relations will, at best, influence Soviet behavior only slightly and gradually. They believe that Soviet behavior depends on two factors:[45]

1. the resources and opportunities available to the Soviet Union
2. the attitudes, preferences, and priorities of its leadership.

As indicated below, whether one places himself in the mirror-imaging or power-maximizing category, or somewhere in between, the thought process that contributes to a

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[44]C. Wolf, Jr., "Soviet Economic Stringencies: External Reactions and Repercussions," p. 6.

[45]C. Wolf, Jr., "Soviet Economic Stringencies: External Reactions and Repercussions," p. 7.

particular way of viewing the Soviet Union has its basic roots in traditional American philosophy.

3. The American Philosophy

American philosophy has a revolutionary flavor much like the Declaration of Independence. It, too, broke away from the oppressive hand of a European influence. Traditional European philosophy framed the questions of, what is reality and what makes up the universe in either/or terms? Either reality and the universe are mind or they are matter.

This way of thinking did not apply to America. Americans were very physical and materialistic people on one hand and believed in a divine power on the other. American philosophical thought led by John Dewey contested the universe is pluralistic. Dewey believed that man is not matter or mind, but experience. Reality lay in the concrete, the immediate, and the developing. Art, science, and religion were all important insofar as each could be controlled and refined by intelligence.[46] This thought allowed for the best of both worlds. Americans can have God and still live a materialistic life. Thus the 1880's saw the birth of American pragmatism.

It was this uniqueness that America based its national interest on. From the 1880's until the end of the first world war, the nation rested on a solid foundation of idealism, reform was the order of the day. World War I and

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[46]H.F. May, The End of American Innocence, p. 147.

its aftermath took its toll on the then American philosophy of pragmatism. The idealism that was once there is eluding contemporary America for various reasons. America is now an ad hoc society. Maybe it is because "fat cats" tend to be lazy, or maybe it is because latter generations failed to pass down the precious meaning of what it is to be an American.[47] America is still in search of this lost idealism. It is evident in political thought and decision-making today. This is where the tie between American philosophy and technology transfer policy lies.

B. SUMMARY

The American mind-set is a key element that determines what approach one follows along the way to answering the technology transfer question. If one adheres to the power-maximizing approach, they are more apt to take the hard-line stance on any question regarding the Soviet Union. Those advocating the mirror-imaging approach may be more willing to extend to the Soviet Union every possible benefit of the doubt. The American Philosophy helps explain the tendencies Americans have toward a soft-liner approach to the Soviet question including the transferring of technology.

It would be a grave mistake to place decision-makers in this either/or position. Nevertheless these categories

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[47]The idea of latter generations failing to pass down the meaning of what it is to be an American is that of Dr. Frank Teti, a professor of National Security Affairs, Naval Postgraduate School, Monterey, California.

serve as a useful tool for the reader in that it enables one to see what approach a policy-maker may have taken when making a decision. With this perspective in mind, the questions regarding technology and the U.S. national security will be explored.

IV. TECHNOLOGY AND US NATIONAL SECURITY

The question of how important is technology to the United States and more specifically the U.S. military-industrial complex and the national security is a primary issue confronting the opportunity cost of technology transfer to the Soviet Union. Two critical concepts will be addressed in the section below. They are technology and national security. Therefore it is imperative to define both. First a definition of technology.

A. DEFINING TECHNOLOGY

"Technology is not science and it is not products. Technology is the application of science to the manufacture of products and services. It is the specific know-how required to define a product that fulfills need, to design the product, and to manufacture it. The product is the end result of this technology, but it is not technology."[48] Technology transfer is the moving of technology from one place to another.

J. Fred Bucy describes a technology in a similar fashion: "A clear distinction should be maintained between

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[48]Maurice Mountain, "The Continuous Complexities of Technology Transfer," p. 8, as presented in National Security and Technology Transfer: The Strategic Dimensions of East-West Trade, Gary K. Bertsch and John R. McIntyre editors; (Westview Press, 1983).

science, technology, and products. Science is the systematic pursuit of knowledge, while technology is the application of that knowledge to the production of specific goods and services. Technology is the design and manufacture know-how required to produce goods. It is the hundreds of detailed steps necessary to manufacture products to meet specific needs. Products, therefore, are the results of technology; and while science is almost always the basis of technology, it, also, is not technology."[49]

B. DEFINING NATIONAL SECURITY

Defining national security is a bit more complex. Every nation is tasked to preserve its national character. This may include a certain standard of living, religious and political freedoms, history and traditions, self-sufficiency, protection from enemies, or anything a nation characterizes its national interests to be. The national security is a plan whose purpose is to protect the national interest from its perceived threats. In the United States, the threat is countered through the maintenance of a strong and capable political and military system. The two do not always work in unison. In fact they tend, by their very nature, to contradict each other. For this reason, national

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[49]J. Fred Bucy, "Technology Transfer and East-West Trade: A Reappraisal," p. 200, as presented in National Security and Technology Transfer: The Strategic Dimensions of East-West Trade, Gary K. Bertsch and John R. McIntyre editors; (Westview Press, 1983).

security policy is most often not the product of rationale, or in keeping with what is best for the national interest.

The Department of Defense defines the national security as being the condition provided by:[50]

1. a military or defense advantage over any foreign nation or group of nations, or
2. a favorable foreign relations position, or
3. a defense posture capable of successfully resisting hostile or destructive action from within or without, overt or covert.

With those two definitions in mind, the question of the worth of technology to the United States can be pursued.

Technology is important to the United States for many reasons. At the conclusion of the second world war the United States was thrown into a role of a world super power and policeman. There was no military or economic equal. Militarily the United States was afforded a nuclear monopoly for a short time and even when that monopoly ended there was a clear Western strategic advantage. Economically the United States was in a golden position with the Bretton Woods monetary system. It was as Dickens put it, "the best of times and the worst of times." The United States came out of the war in the best shape of all the allies. With the good fortune came the responsibility, the isolationist policy would be no more, although the attitude of being an island still remains in the American people. This is one of

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[50]M. Mountain, "The Continuing Complexities of Technology Transfer," p. 8.

the reasons it is so difficult to maintain a strong military posture that is able to protect the national interest. That is why the technological advantage the US has over the Soviet Union is so important.

The Soviet Union has made it a two horse race. There are now the "global powers," two countries able to project power anywhere on the face of the earth. The USSR has rivaled the United States in strategic might, surpassed the U.S. in conventional might and is knocking on the door of our sea cabin. The short of it all is that the Soviet Union holds an advantage in the numbers. Parity is maintained by the United States' clear technological superiority. The Soviet Union can not compete with U.S. technology and the United States would be hard pressed to compete with a garrison state in force and weapons size. Former Secretary of Defense Brown, in testifying before Congress in support of the Fiscal Year 1979 Defense budget, stated, "We rely increasingly on the sophistication of our equipment to compensate for potential superiority in enemy numbers."[51]

The question of just how important is the transfer of U.S. technology to the Soviet Union can be argued in different ways. Economically speaking, the Soviet Union is another market. Not selling technology to the Soviets would mean a loss of revenue to U.S. businesses. They may argue

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[51]M. Mountain, "The Continuing Complexities of Technology Transfer," p. 9.

that no matter how small the profits, it is still money in the bank and in keeping with the United States' free trade policies. Besides, if American companies do not sell to the Soviets, the West Germans, Japanese, Italians, or French will.

West Germany is the largest single supplier of Western technology to the Soviet Union. In 1980, 6.2% of Germany's foreign trade was with communist countries, of which the Soviet Union is the most important.[52] Politically for the West Germans, it is important to maintain good relations with the Soviets, not just for security reasons, but because the Soviets will allow them closer ties with the East Germans. This is just one example of how a NATO allies' national interest conflicts with that of the United States. Politically for the United States some argue that a friendly policy of technology transfer with the Soviets will ease overall superpower tension. This was the basic theory behind detente.

After considering the above arguments, it is clear that the major importance of technology lies in its strategic significance. As long as U.S. strategic policy is based upon the possessed technological advantage its weapons have over the Soviets, and as long as a strategic doctrine

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[52]M. Mountain, "The Continuing Complexities of Technology Transfer," p. 22.

dictates a come-as-you-are war, the importance of technology can not be overemphasized.

C. SUMMARY

Technology may very well be the United States' manifest destiny. As America moves from an industry-oriented economy to a service-oriented nation, technology plays an ever increasing role in the well-being of this sovereignty. The linkage between technology and U.S. National Security is strong. Maintaining a technological edge over the Soviet Union is paramount to survival of the keeper of democracy.

It is clear that there is a positive relationship between technology and U.S. national security. The role Western technology plays in enhancing the capabilities of the Soviet defense industry will be addressed in the next chapter.

V. WESTERN TECHNOLOGY AND THE SOVIET DEFENSE INDUSTRY

The purpose of foreign trade is to maximize a nation's income without adversely impacting its national security. For the vast majority of cases this is not a problem. Trade with one's allies is deemed mutually beneficial, and trade with one's adversary usually has built-in governmental regulations that ensure transfer agreements do not conflict with national security. This is not the case across the board. A problem arises when transferring technology. There are no clear choices since in many instances the apparent military value, or lack of it, is not easily noticeable.[53]

This chapter will explore the manner in which technology affects the Soviet Union; how technology figures in their foreign and domestic policies and their plan for economic growth,and by what ways they acquire the technology needed to feed their military machine or maintain a favorable domestic climate.

The Soviet Union is greatly concerned about fighting two kinds of battles with the United States that they could not possibly win. One is economic battle and the other is technological battle.

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[53]J.F. Bucy, "Technology Transfer and East-West Trade: A Reappraisal," p. 199.

Strategic Defense Initiative (SDI) is both a technological and economic battle in which the Soviets could not hope to successfully compete and/or win. Their only chance would be to acquire the technology covertly, and with great strain to their economy proceed with development at the expense of domestic well-being and possible other areas of their military. The Soviets counter economic or technological warfare with a propaganda strategy designed to end the war before it can do any real damage to them. Vernon Aspaturian gives a good example of the successful utilization of this strategy. "In the face of Soviet complaints and mild threats, Jimmy Carter had canceled the B-1 bomber, vetoed construction of another attack carrier, decided not to build the neutron bomb (after pressuring European leaders to publicly accept it even at some cost in terms of their internal political support), and retreated on the whole host of issues connected with the SALT II agreements, including matters connected with the cruise missile, the Backfire bomber, ICBM ceilings, and verification capabilities."[54] It is obvious why the Soviet Union does not desire to get into an arms race with the United States. According to a CIA report the Soviets spend as much as 13-14 percent of their GNP for

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[54]Vernon V. Aspaturian, "Soviet Global Power and the Correlation of Forces," p. 7, Problems of Communism, May-June 1980.

defense.[55] Another source estimates Soviet defense spending somewhere between 11 and 15 percent of their GNP.[56] Spending of this nature puts an enormous strain on the Soviet economy, a reason Gorbachev has reiterated over and over his desire to halt the arms race.[57]

What is less obvious is the impact that Western technology has on their economy, and in particular their military-industrial complex. There is no question that the Soviet Union places the acquisition of Western technology in high esteem and they have for some time. As far back as the 1930's, the Soviets have expended enormous amounts of its resources, both financial and human, for the purpose of acquiring Western technology for just one purpose--that is to enhance its military capabilities and improve the efficiency of its military-industrial technology.[58] The Soviet military leaders place a high emphasis on the importance of technology. According to Marshall Ogarkov, "The development of production and the level of science and technology

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[55]Abram Bergson, "Gorbachev Calls For Intensive Growth," Challenge, p. 14, November-December, 1985.

[56]Carl Gershman, "Our Technology to Russia for Profit," Business and Society Review, p. 34, Winter 1979-1980.

[57]A. Bergson, "Gorbachev Calls For Intensive Growth," p. 14.

[58]Central Intelligence Agency, "Soviet Acquisition of Western Technology," p. 92, as presented in National Security and Technology Transfer: The Strategic Dimensions of East-West Trade, Gary K. Bertsch and John R. McIntyre editors; (Westview Press, 1983).

determine the level of weapons technology. This, along with the size and type of population, has a direct influence on manning and organization of the armed forces and on methods of preparing for and waging war on any scale including strategic."[59]

According to a U.S. News and World Report article that quoted the contents of a CIA-summarized top-secret intelligence study for Congress, the Soviet Union is making an all-out effort to acquire technology in ten critical areas in which they lag behind the United States.[60] These areas are as follows:

1. Guidance technology. This not only includes missile guidance technology that ensures ballistic missile accuracy, but also navigation technology. The Soviets place a specific emphasis on submarine navigation, a prerequisite for accurate sub-launched ballistic missiles.

2. Rocket propulsion. This is primarily in the area of solid rocket propulsion technology.

3. Missile defense. The Soviets are interested in enhancing their means to detect hostile missile, delineate between warheads and decoys, and process radar-derived targets for use by their defensive missiles.

4. Aircraft technology. The Soviets are primarily interested in the areas of engine technology and lightweight composites.

5. Computer-assisted design.

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[59]Harriet Fast Scott, and William F. Scott, The Soviet Art of War: Doctrine, Strategy, and Tactics, p. 88, Westview Press, Inc., 1982.

[60]"The High-Tech Secrets Russia Seeks in West," U.S. News and World Report, p. 44, May 3, 1985.

6. Antisubmarine warfare. The United States has a clear advantage in ASW. The Soviet Union would like to narrow this gap.

7. Submarine quieting. A quieter submarine makes the ASW problem more difficult.

8. Large carriers. The Soviet Union is designing and building large aircraft carriers for the possible purpose of giving their Navy a power projection role.

9. Computer equipment. Computer technology is applicable to all aspects of Soviet military development.

10. Smart bombs. The Soviet Union is interested in smart bombs because of their application to anti-tank warfare.

The Soviets have been very successful in acquiring Western technology by a combination of legal and illegal means.[61] Legally the Soviets acquire Western technology through open literature, legal trade channels, and student, scientific, and technical exchange programs. Legal trade channels tend to benefit the Soviet Union over the United States. Undersecretary of Defense for Research and Engineering, Dr. William Perry, explains, "The scale of technology to the Soviet Union has been of relatively small benefit to the Western world, but of very great benefit to the Soviet Union--both directly and indirectly assisting their military objectives."[62] Dr. Miles Costick, Director of the Institute on Strategic Trade in Washington, takes the problem one step further. "It is virtually impossible to

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[61]Central Intelligence Agency, "Soviet Acquisition of Western Technology," p. 93.

[62]"U.S. Builds Soviet War Machine," Industrial Research and Development, July 1980, p. 54.

identify a single industry in the USSR which manufactures only civilian goods."[63] Mills brings up an important question of dual use technology, i.e., technology that can be applied to both military and civilian use. There is no doubt that the Soviet Union's priorities are to filter acquired technology into the military sector. According to a CIA study, dual-use technology "almost always finds its way first into military industry, and subsequently into the civilian sectors of industries that support military production. Thus, Soviet assurance that legally purchased dual-use technology will be used solely for civilian applications can seldom be accepted at face value."[64]

On the illegal side, there is a major and increasing problem of the most advanced Western technology being acquired by clandestine means. One theory is that this acquired technology has a significant impact on the Soviet defense industry. William Smits, Jr., a supervisor special agent with the FBI in San Francisco, who has recently completed a doctoral dissertation on High Technology Transfer to the Soviet Union and East-bloc countries, contests that there are immense savings to the Soviet defense industry as a result of reverse-engineering and outright theft. He further states, "These acquisitions are incorporated into Soviet strategic, aircraft, naval and tactical systems, as

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[63]"U.S. Builds Soviet War Machine," p. 54.

[64]"Soviet Acquisition of Western Technology," p. 94.

well as microelectronic and computer systems. During the past 10 years the Soviets have acquired sufficient microelectronic equipment to meet almost 100 percent of the needs of their military forces and 50 percent of their overall microelectronic needs."[65]

How much overall did the Soviet Union benefit from Western technology acquired legally and illegally, including by clandestine means? According to the CIA, it was quite significant. The legal and illegal acquisition program has allowed the Soviet Union to:

1. Save hundreds of millions of dollars in R&D costs, and years in R&D development lead time.

2. Modernize critical sectors of their military industry and reduce engineering risks by following or copying proven Western designs, thereby limiting the rise in their military production costs.

3. Achieve greater weapons performance than if they rely solely on their own technology.

4. Incorporate countermeasures to Western weapons early in the development of their own weapons programs.

Thane Gustafson paints an equally grim picture as to the impact Western technology has on the Soviet Union. Gustafson believes imported Western technology could lead the Soviets into a position where they could have a short-term military advantage in two ways. The first is a technological transfer that leads directly to a revolutionary breakthrough; and the second is a transfer "that suddenly

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[65]Ken Kovacs, "Soviet Spies Steal Silicon Valley Secrets," Golden Gate Magazine, Winter 86, Vol. xiv, no. 1, p. 3.

fills a gap, overcomes a bottle-neck, or completes a puzzle in an otherwise mature Soviet technology, enabling the Soviets to proceed to a sudden generational improvement in a major weapons system."[66]

Some specific examples of Western technology having a significant impact on Soviet military/weapon design can be seen in the Soviet AWACS, space shuttle, SU-15 fighter, the Blackjack bomber, and the AA-2 Atoll and the SA-7 Grail missiles.

According to Edgar Ulsamer, "The Soviet AA-2 Atoll family of air-to-air missiles . . . is copied from the US AIM-9 Sidewinder missile. The Soviet SA-7 Grail surface-to-air missile is clearly derived from the US Army's hand-held Redeye antiaircraft weapon."[67] There are also close similarities between the Soviet Blackjack bomber and the older B-1A.[68] Ulsamer further argues that "The SU-AWACS is strikingly similar to the Air Force's E-3A AWACS."[69]

Evan Thomas of Time Magazine is equally as convinced of similarities between Soviet and U.S. weapons systems. He

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[66]Thane Gustafson, "Effects and Dangers of Technology Transfer," p. 113, as presented in National Security and Technology Transfer: The Strategic Dimensions of East-West Trade, Gary K. Bertsch and John R. McIntyre editors; (Westview Press, 1983).

[67]Edgar Ulsamer, "Moscow's Technology Parasites," Air Force Magazine, December 1984, p. 54.

[68]E. Ulsamer, "Moscow's Technology Parasites," p. 54.

[69]E. Ulsamer, "Moscow's Technology Parasites," p. 54.

states, "The Soviet AWACS and space shuttles are carbon copies of earlier U.S. models . . . and . . . The SU-15 fighter that shot down the Korean Airline's Flight 007 two years ago did so with a missile guidance system designed in the U.S."[70]

A report given before the Hearing Before the Permanent Subcommittee on Investigations of the Committee on Governmental Affairs, United States Senate, stated that there are hundreds of examples of Soviet military equipment and weapons of the 1980's and 1990's that have benefited or will benefit from the products and technologies of at least a dozen different Western countries.[71] For the field of aviation alone these include:[72]

Four new fighter aircraft

New tactical fighter of the 1990's

A supersonic aircraft

Ground attack aircraft

Airborne command post

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[70]Evan Thomas, "Moles Who Burrow for Microchips," Time Magazine, June 17, 1985, p. 25.

[71]"Soviet Acquisition of Military Significant Western Technology: An Update," April 1982, p. 31. Exhibit No. 1, Hearing Before the Permanent Subcommittee on Investigations of the Committee on Governmental Affairs, United States Senate, Ninety-Seventh Congress, Second Session, 4,5,6,11, and 12 May 1982.

[72]"Soviet Acquisition of Military Significant Western Technology: An Update," p. 31.

Reduced-infrared-signature aircraft

Four transport aircraft

Reusable space shuttle

Air-to-air missile (US Phoenix-like)

Fire-control system for three fighters

Gas turbine engine

Ramjet engine

The Soviet Union acquires much of Western technology directly by approaching individuals closely related to specific weapons systems research and development and exploiting their weaknesses, whether it be an economic problem or something the individual wants to hide such as homosexuality. This tactic enables the USSR to stay abreast of technological development as it is happening, which in turn speeds up assimilation of this technology into their own systems, thus reducing the time lag between a U.S. and Soviet-like weapons system. It also allows the Soviet Union means to evaluate the capabilities and limitations of the most advanced U.S. weapons. This greatly enhances their ability to develop counter weapons to defeat the U.S. systems.

An example of this tactic can be seen in the case of William H. Bell, a radar project engineer at Hughes Aircraft. Bell was approached by a Polish intelligence officer who befriended him. One thing led to another and soon Bell accepted much needed financial assistance enabling

him to afford a down payment on a condominium. Over a three year period Bell received $110,000 in return for information on such systems as the Patriot, surface-to-air missile, a NATO air defense system, and the Phoenix air-to-air missile carried on the Navy's F-14 fighter. According to Richard Perle, the Assistant Secretary of Defense for International Security Policy, "The most important material Bell handed over to the Eastern Bloc was on the look-down, shoot-down radar system of the F-15 fighter--a major advance in avionics which permits the aircraft to distinguish low-flying objects from ground clutter."[73]

The counter argument to the great role Western technology plays in the Soviet defense industry is articulated by Julian Cooper. Cooper's thesis is that although undeniably the Soviet defense industry has benefited by successfully exploiting acquisitions of Western technology in the form of accelerated weapons development, to what extent they have benefited has been greatly exaggerated. Cooper argues that this acquisition of technology is done on a selective basis, and always with the strategy in mind of not becoming dependent on the West for technology.

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[73]Richard Perle, "Technology and the Quiet War," Strategic Review, Winter 1983, p. 34.

Furthermore, he states that the assimilation of Western technology has not been "either trouble- or cost-free."[74]

Bruce Parrott agrees with Cooper's view on the Soviet Union's approach to acquiring Western technology and its impact. Parrott argues, "More than most Western critics of technology transfers to the Soviet Union realize, the regime's attempts to avoid ideological contamination from the West have hampered its efforts to absorb Western technical knowledge."[75]

Cooper sums up the feelings of the school of thought that believes a detente-like relationship with the Soviet Union is best for the superpowers and the world as a whole. Cooper argues, "It cannot be ruled out that in the future, not only Western security, but also the survival of humanity, may be best served by tolerance of broad East-West military technological parity in the framework of mutually agreed quantitative arms limitations, with a depoliticization of the whole issue of technology transfer."[76]

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[74]Julian Cooper, "Western Technology and the Soviet Defense Industry," p. 197, as presented in Trade, Technology, and Soviet-American Relations, Indiana University Press, 1985.

[75]Bruce Parrott, "Technology and the Soviet System," Current History, October, 1983, p. 328.

[76]J. Cooper, "Western Technology and the Soviet Defense Industry," p. 197.

A. TECHNOLOGY AND SOVIET ECONOMIC GROWTH

Consider the assumption that what is good for the Soviet economy is good for the defense industry. The next logical question might be, just what impact does Western technology have on Soviet economic growth? Unlike in the United States, a strong and prosperous economy equates to a more burden-free and strong military apparatus. There is no constituency in which to sell the defense budget. It seems no matter how economically oppressed the average Soviet citizen is, he still seems to realize the necessity of maintaining a strong defensive posture in order to protect the "motherland." There are enough Soviets around that personally remember the Great Patriotic War. Besides, as long as the economy shows improvement, no matter how small, the Soviet citizen is reminded that the socialist system works. There is no doubt though, that maintaining a strong defense takes its toll. Soviet General-Lieutenant I. Zavyalov expressed the dilemma this way, "As military affairs develop they make higher demands of the economy. Not only in terms of the quantity and quality of arms and equipment, but also with respect to the full-time defense industry and to raising the readiness of other industries to switch onto a military footing, rationally siting production capabilities, and insuring the survival of economic centers."[77]

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[77]Mark E. Miller, "The Role of Western Technology in Soviet Strategy," Orbis, Fall, 1978, p. 549.

Therefore, it is imperative to briefly entertain the question, how does Western technology impact the Soviet economy?

There is considerable empirical evidence that Western technology only marginally affects the Soviet Union. Mark E. Miller explains that in the inadequate Soviet machine-building sector, in 1976, machinery imports from the West amounted to in excess of $4.2 billion or 36.5 percent of total capitalist exports to the USSR.[78] This led Miller to reasonably expect Western technology to have a great impact on Soviet economic growth. According to Miller, a recent study by Donald Green and Herbert Levine concluded that between 1968 and 1973 Western machinery added slightly more than 1 percent to overall Soviet economic growth and 2.5 percent to industrial growth.[79]

To sum up Miller's thesis, he believes, "Soviet investment in Western technology is rather small, and total impact on the Soviet economy is modest. At the same time, the effect on Western technology on certain sectors has been substantial, raising both productivity and the quality of output." Further he contests, that Western technology serves as a "quick fix" for the technologically critical industries and basic strength of the Soviet economy. The

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[78]M.E. Miller, "The Role of Western Technology in Soviet Strategy, p. 554.

[79]M.E. Miller, "The Role of Western Technology in Soviet Strategy," p. 55.

precious hard currency they spend on technology is well thought out and needed to augment their other than consumer sector, the military.[80]

Although Western technology does not greatly impact Soviet growth, it does impact their critical industries.[81]

B. SUMMARY

Without question technology is key to the maintenance of the Soviet war machine. The USSR needs advance technology to ensure that the technological gap between the United States and the Soviet Union does not increase. There is also the possibility, as Thane Gustafson points out, that acquired Western technology can lead directly to a revolutionary breakthrough or it may suddenly fill a gap, overcome a bottleneck, or complete a puzzle that Soviet technology alone could not do.

The question, how does Western technology affect Soviet economic growth, can be answered quite briefly. It has a negligible impact.

Up until this point of this study three critical observations can be made. One, a defense is imperative to a successful pursuit of the national interest; two, technology

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[80]M.E. Miller, "The Role of Western Technology in Soviet Strategy," p. 558.

[81]It is difficult to say how significant is the impact on critical Soviet industries. There is much room for empirical review on this aspect of Western technology and Soviet economic growth.

is a key element of U.S. National Security; and three, that the acquisition of Western technology is deemed crucial to the Soviet defense industry and the Soviet Union benefits greatly by it.

The next two chapters of this thesis will examine the area of the Third World military-industrial complex and the Soviet Union's arms trade with the Third World. The purpose of this exercise is to see if there is any linkage between Western technology and the Third World defense infrastructure that may prove to have a beneficial effect for the Soviet Union.

VI. THE THIRD WORLD ARMS TRADE AND ARMS INDUSTRY

The maintenance of a military is important to Third World nations for various reasons. Probably the foremost motivator that prompts all nations to establish a military and maintain an adequate defense posture is the perceived external threat.

The perceived threat provides the motivation, but how large, well-equipped, and trained a nation's military is depends largely on the resources at its disposal, along with a commitment to maintain a strong defense posture.

Categorizing Third World nations can be difficult, although a useful way to look at them is as those nations that produce arms indigenously (producers), and those that do not produce arms (non-producers). A few examples of Third World nations that manufacture their own arms are Israel, India, Brazil, Egypt, South Korea, and Argentina.

The Third World defense industries and their association with Soviet technology will be examined in this chapter. The pursuit of this subject is important to the development of this chapter because even indigenous arms producers do not produce one hundred percent of the weapons that they need. In some cases much of the additional arms is obtained from the Soviet Union. For example, India produces Soviet-designed weapons via license. The possibility that Soviet

technology has been incorporated in the indigenous production of some Third World area will be explored. To do this it is necessary to understand the role of Third World arms producers in order to establish a link, or lack thereof, between Western technology to the Third World arms industry via the Soviet Union as the middle-man. This feasibly can happen either through arms exports that assimilated Western technology or by cooperative joint ventures such as licenses that allow production or arms that have Western technology assimilated into them. If this hypothesis is proven to be true, the Soviet Union benefits twice from acquired Western technology. First in their initial use of Western technology and second from the hard currency it earns from the arms sales to a Third World client. On the other hand, the Third World nation benefits from Western technology not only in the product it buys but also if through its own indigenous production via license or reverse-engineering. The preceding link to the national interest is that they undermine national defense, an element paramount to obtaining both national and public interest goals.

A. HISTORICAL BACKGROUND

Third World arms production is not a new concept. As early as the 19th century both warships and small arms were produced in Egypt, India and some of the Latin American

countries.[82] Those countries lost their competitiveness at the turn of the century when they began to lag behind the industrializing countries in terms of new methods of steel production and high-precision manufacturing.[83] Arms production in the Third World began to increase in the 1930's due primarily to unrest in Europe and was significantly accelerated during World War II. After World War II technology began to play an ever-increasing role in the field of arms production. Weapons systems became increasingly more sophisticated. The technological gap was widened even further between the industrialized countries and the Third World because of advances made during the war. This gap is accountable for all, but limiting a few Third World nations, such as Argentina and Egypt, and to a lesser degree Colombia, India and North Korea to producing primarily only naval vessels during the 1950's. This production, although limited, was growing.[84]

The first half of the sixties carried the same slow growth and limited production as that of the 1950's. Although, the second half of the 1960's revealed an increase

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[82]Michael Brzoska and Thomas Ohlson, Arms Production in the Third World, p. 7, edited by Michael Brzoska and Thomas Ohlson, Stockholm International Peace Research Institute, Taylor and Francis, London and Philadelphia, 1986.

[83]M. Brzoska and T. Ohlson, Arms Production in the Third World, p. 9.

[84]M. Brzoska and T. Ohlson, Arms Production in the Third World, p. 7.

in growth with the addition of Brazil, Israel, and South Africa to the numbers of producers.[85] This increase in growth was to last until the 1980's, simultaneously with the halting in the growth of arms trade with the Third World.[86] According to M. Brzoska and T. Ohlson, "Growth in production came to a halt in the 1980's, at the same time as the arms trade with the Third World ceased to grow. The main explanations for both changes in trend are the same: first, the global economic crisis limited arms procurement budgets in most countries; and second, some countries felt the effects of a saturation in weapons which had been produced indigenously or purchased from abroad in the 1970's."[87]

B. THE PERCEIVED THREAT

The perceived threat may be generated from within as in the case of a government lacking in legitimacy using a military to maintain control, or externally, from the threat of a rivaling neighbor. The perceived threat may also be a combination of the two. Edward A. Kolodziej and Robert E. Harkavy link the perceived threat with a multi-factored

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[85]M. Brzoska and T. Ohlson, Arms Production in the Third World, p. 7.

[86]M. Brzoska and T. Ohlson, Arms Production in the Third World, p. 7.

[87]M. Brzoska and T. Ohlson, Arms Production in the Third World, p. 7.

approach that influences the development of a security policy. Their approach is as follows:[88]

Inputs to the Development of Security Policy

A. Internal

1. Population: size, composition, etc.

2. Resources

3. Economic development: agriculture; industry; skill of labor force; trade and commerce; research and development; etc..

4. Government structure and regime politics: civil-military relations; inter-service rivalry; bureaucratic politics, etc.

5. Religion: ideological, social, ethnic, linguistic cleavages, etc.

B. External

1. Geo-political setting

2. Global and regional security systems; distribution of military power; alignments and alliances; actors; nation-states, international organizations, transnational groups.

3. Global and regional economic systems (dependent, independent, interdependent) domains: monetary; trade; investment; resource distribution, etc.

4. Adversary relations and issues

All of the above enter into the perceived threat equation.

The perceived threat may be the greatest motivator in a Third World nation deciding to import arms as well as

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[88]Edward A. Kolodziej and Robert E. Harkavy, Security Policies of Developing Countries, D.C. Heath and Company, Lexington Massachusetts, 1982, p. 17.

produce arms. Other variables associated with the arms production decision-making process may include one or all of the following: unstable military security relationships and alliances; vulnerability to manipulation by exporters; national pride; employment in high technology; technological stimulation in other areas; import substitution and export potential.[89]

C. THE PRO'S AND CON'S OF ARMS PRODUCTION

Arms production can be viewed as having a beneficial or adverse effect on a Third World nation. The issue of defense expenditures is at the core of the pluses and minuses of any argument. A basic question that needs to be addressed is whether or not defense spending is beneficial to a nation. According to a Federal Reserve Bank of San Francisco weekly letter, in the United States alone, growth in defense spending may have been responsible for as much as 10 to 20 percent of total economic growth in California during 1984. This accounted for the creation of 7,500 additional jobs.[90] This is one point of view in a very

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[89]G.M. Steinberg, "Israel: High Technology Roulette," p. 163, as presented in Arms Production in the Third World, edited by Michael Brzoska and Thomas Ohlson, Stockholm International Peace Research Institute, Taylor and Francis, London and Philadelphia, 1985.

[90]Kristin Hotti and Carolyn Sherwood-Call, "The Contract Defense Industry in the West," Federal Reserve Bank of San Francisco, Weekly Letter, March 28, 1986.

controversial subject. If true, how does defense spending impact Third World nations?

There tends to be a common belief throughout the world that social and military development by their very nature are opposites.[91] Some scholars believe that the purpose of government is to first feed, clothe, educate, rid the nation of disease, and ensure employment opportunities, before spending money on defense. This line of thought insinuates that defense expenditures prevent Third World governments from performing their just duties. In brief, "resources devoted to defense cannot be employed elsewhere."[92] David K. Whynes cites an example of the results when a nation places defense priorities before the basic needs of the people. Whynes states, "In the Philippines in 1974, some 15,000 persons died violently, of whom perhaps one-half were killed in civil disturbances. Primarily as a result of these disturbances, annual military expenditures have more than quadrupled since 1972, whilst the armed forces have tripled in size. On the health front, however, the statistics paint a different picture. In the same year, 28,000 persons died of tuberculosis, 46,000 from pneumonia

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[91]Bruce E. Arlinghaus, "Social versus Military Development: Positive and Normative Dimensions," p. 39, as presented in Arms Production in Developing Countries, James Everet Katz, editor, D.C. Heath, Lexington, Massachusetts, 1984.

[92]David K. Whynes, The Economics of Third World Military Expenditure, University of Texas Press, Austin, 1979, p. 115.

and 13,000 from nutritional deficiencies, diseases all of which are associated with poor living conditions, inadequate food and, in general with poverty . . . The moral is clear; guns kill in more ways than one."[93]

This line of reasoning is echoed in the words of Lance Taylor. Taylor argues that, ". . . arms spending has strong effects on the evolution of the economy, mostly of an unfavorable sort."[94] He believes that defense spending in many parts of the Third World buys little security. Taylor contributes much of the negative effects that defense spending has on a nation to the numerous wars in the Third World and the devastating effects they have on their economies. For example, he sites Kampuchea, Bangladesh, Uganda, and Nigeria as countries in the 1970's that "suffered devastating famines--equivalent in economic terms to the loss of several years' GNP growth--that were direct results of wars. If this trend of the last decade continues, the 1980's arms effort of the Third World may bring all economic programs to a devastating halt."[95] Those scholars who support this school of thought are not without nemesis.

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[93]D.K. Whynes, The Economics of Third World Military Expenditure, p. 152.

[94]Lance Taylor, "Military Economics in the Third World," a paper prepared for the Independent Commission on Disarmament and Security Issues, October 1981, p. 7A.

[95]L. Taylor, "Military Economics in the Third World," p. 2.

In a study by Robert E. Looney and P.C. Frederiksen in which they reexamined the relationship between growth and defense spending in developing countries, they concluded that, among resource constrained nations, the relationship between military expenditures and economic growth was statistically insignificant. Their results yielded a positive linkage between growth and military expenditures for the unconstrained group of nations.[96]

It is very difficult to make broad generalizations of the Third World in regard to defense expenditures. A more appropriate way to address the subject is to Lilliputianize the concept of the Third World. One way to do this is to address the Third World in the terms of subgroups such as arms producers and non-producers, or resource constrained and non-constrained. Another way to address the subject is to explore the effects of Third World defense expenditures on a case by case basis.

D. ARMS PRODUCERS

According to Brozoska and Ohlson there is a definite linkage between arms production and civilian production, and there are two factors that must be present for successful large-scale arms production. These are the existence of a

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[96]Robert E. Looney and P.C. Frederiksen, "Defense Expenditures, External Public Debt and Growth in Developing Countries," Naval Postgraduate School, Monterey, California 93943-5000, p. 15.

sufficiently large and differentiated industrial base, and a substantial domestic military market.[97]

E. ARMS PRODUCTION VS. ARMS IMPORTS

The primary motivation for arms production should be as a substitute for arms imports.[98] This may not be the case where Third World nations are concerned. There has been a slow but steady increase in the percentage of arms production to arms imports in the Third World during the 1960's. This percentage leveled off in the 1970's to the point of 10 percent of arms imports.[99] This trend is explained by the substantial increases in arms imports in countries such as Iran, Iraq, Libya, Saudi Arabia and Syria that counter the effects of increased Third World arms production.[100] According to Brzoska and Ohlson, "For the early 1980's, there is again an upward trend. (By comparison, it is estimated that about 95 percent of the U.S. and Soviet weapon inventories are produced domestically; the corresponding share for medium-size industrialized countries is around 70-80 percent; and for countries like Austria,

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[97]M. Brzoska and T. Ohlson, Arms Production in the Third World, p. 28.

[98]M. Brzoska and T. Ohlson, Arms Production in the Third World, p. 27.

[99]M. Brzoska and T. Ohlson, Arms Production in the Third World, p. 28.

[100]M. Brzoska and T. Ohlson, Arms Production i the Third World, p. 28.

is around 70-80 percent; and for countries like Austria, Sweden and Switzerland, the share is estimated at 40-60 percent).[101] Further they argue, in regard to Third World nations, ". . . it is not the countries with the highest production values that have become least dependent on arms imports."[102]

There are many factors that may drive a nation to produce its own arms. One reason may be because arms production is a source of pride. Another is fear of having an arms supply or parts cut off. This was certainly a major consideration in South Africa's decision to become an arms producer.

After World War II, the South African Afrikaner regime developed its own arms industry because, firstly, it foresaw the possibility of arms imports being cut off as a protest of their policy of apartheid by Western suppliers and potential United Nations embargoes, and secondly, the creation of an arms industry was perceived as one way to rectify the historic Afrikaans-English-speaking imbalance in terms of ownership of industry.[103] The development of an arms

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[101]M. Brzoska and T. Ohlson, Arms Production in the Third World, p. 28.

[102]M. Brzoska and T. Ohlson, Arms Production in the Third World, p. 28.

[103]Timothy M. Shaw and Lee Dowdy, "South Africa," p. 318, as presented in Security Policies of Developing Countries, D.C. Heath and Company, Lexington Massachusetts, 1982.

industry was further seen as an enhancement to South Africa's technological base.[104]

South Africa has developed a defense and strategic base in the areas of conventional arms, nuclear weapons, and indigenous energy production.[105] They have been very successful in their arms industry endeavor. According to Lewis Gann and Peter Duignan, "The defense complex, including ARMSCOR (Arms Corporation of South Africa Limited) with its subsidiary arms factories, is one of the country's most advanced technical organizations, one that is engaged in manufacturing, operating and maintaining a wide range of highly sophisticated equipment. About 45% of defense expenditures goes to internal development . . . South Africa's industrial infrastructure enabled the country to emphasize self-sufficiency in arms production and improvement in its ability to withstand foreign economic pressures. . . ."[106]

The reasons that Israel created an arms industry are similar to South Africa in that it felt itself vulnerable to the manipulation of exporters. However, that was not the only reason. According to G.M. Steinberg, "Israel's security, its relative international isolation and the

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[104]T.M. Shaw and L. Dowdy, "South Africa," p. 318.

[105]T.M. Shaw and L. Dowdy, "South Africa," p. 318.

[106]T.M. Shaw and L. Dowdy, "South Africa," p. 318.

absence of reliable military allies have together provided the historical basis for development of the military industry."[107]

Israel has fought six wars since its independence in 1948. A common theme present throughout all those wars was a difficulty in obtaining arms externally. There have been arms embargoes laid upon Israel since its rebirth. And the United States, Israel's chief external arms supplier, has delayed arms sales in lieu of political concessions on numerous occasions.[108] On each occasion of a delay or embargo, Israel has sought to decrease dependence on the United States.[109]

The single most important reason that Israel has established a defense industry is national existence. Economic factors although play an important role in the decision process as to develop an indigenous arms industry. Steinberg argues that, "Local production allows for import substitution and, in theory, an improved balance of payment situation."[110] Further, "In a broader sense, an indigenous arms industry is seen as providing an industrial

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[107]G.M. Steinberg, "Israel: High-Technology Roulette," p. 163.

[108]G.M. Steinberg, "Israel: High-Technology Roulette," p. 163.

[109]G.M. Steinberg, "Israel: High-Technology Roulette," p. 163.

[110]G.M. Steinberg, "Israel: High-Technology Roulette," p. 163.

infrastructure for Israel. Technology can be developed and spun off to the civil sector. Isolated and underdeveloped regions of the country can be developed through location of military-related industries in these areas and secure employment provided."[111]

Bernard Reich believes that Israel has made important strides in its arms industry but not without difficulties. He states, "An indigenous military industry has been an element of security planning since independence, and considerable resources have been invested in it with uneven results. Its basic shortcomings have been resources, both natural and financial. There is also the problem of economics of scale and the difficulties posed by the enormous start-up costs involved in the development and production of a sophisticated weapons system."[112] Reich believes that although Israel's military exports have earned them a substantial amount of foreign exchange, they still remain dependent upon the United States for many sophisticated weapons systems and some advanced components for their indigenous production. They also remain dependent on other nations for critical raw materials.[113]

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[111]G.M. Steinberg, "Israel: High-Technology Roulette," p. 163.

[112]Bernard Reich, "Israel," p. 216, as presented in Security Policies of Developing Countries, D.C. Heath and Company, Lexington Massachusetts, 1982.

[113]B. Reich, "Israel," p. 216.

Another important problem facing Israel is their human-resource situation. As a country with a population of about four million it is very difficult to compete on the level they desire.[114]

India faces the same technological disadvantages as fellow Third World nations. Defense planning in any Third World nation must consider the advantages and disadvantages of the following two production options. One, a nation can indigenously produce weapons. The obvious advantage in this approach is political immunity from outside interference. The disadvantages lie in comparative qualitative factors and time lags between research and development and actual service entry. There is also the problem of not being able to guarantee that a weapons system will perform to the minimum acceptable levels.

The second approach is production by license. This alleviates the chances of a system not performing as desired. It also eliminates costly research and development expenses and unavoidable setbacks of trial and error.[115] According to Raju G. C. Thomas, one disadvantage to the license approach is that ". . . it does not provide Indian scientists and engineers with sufficient training and

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[114]B. Reich, "Israel," p. 216.

[115]Raju G.C. Thomas, "Defense Planning in India," p. 256, as presented in Defense Planning in Less-Industrialized States, Stephanie G. Neuman, editor, D.C. Heath and Company, Lexington, Massachusetts, 1984.

experience in weapons design and development since the drawings are directly supplied by the overseas manufacturer."[116]

India's defense acquisition policy varies from service to service and complexity of systems. The dependent variables are based on whether a system is capital or labor intensive and technologically simple or advanced. Thomas argues, "As compared to the labor-intensive and technologically simpler defense programs of the army, the defense programs of the air force and the navy tend to be more capital intensive and call for relatively more sophisticated technology." During the 1950's, India attempted to indigenously design and produce a Mach-2 capable fighter-bomber called the HF-24 Marut. There were numerous design and production setbacks. The Marut was not delivered until the late 60's, and when it was delivered it did not have a Mach-2 capability and was already obsolete. This fact coupled with its poor performance during the 1971 Indo-Pakistani war prompted Indian officials to phase the Marut out of production.[117]

Because of the Marut incident, India adopted a policy of directly purchasing more advanced weapons with a subsequent plan to manufacture under license.[118] This is especially true in regard to advanced aircraft. During the 1980's,

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[116]R.G.C. Thomas, "Defense Planning in India," p. 256.

[117]R.G.C. Thomas, "Defense Planning in India," p. 257.

[118]R.G.C. Thomas, "Defense Planning in India," p. 256.

India planned to purchase the Anglo-French Jaguar fighter-bomber. Both aircraft were planned, purchases followed by subsequent manufacture under license in India. The United States' decision to sell the F-16 aircraft to Pakistan prompted the Indian government to scrap the license phase of its plan in order to receive a greater number of Jaguars in the short-term. India's license production of the aircraft was not to provide deployment until the late 1980's at the earliest.[119] As seen later in this study the plan to purchase the Jaguar aircraft never materialized.

As it has been pointed out, there are some similarities as to why a Third World nation becomes an arms producer. There are also common problems associated with constrained resources that affect all Third World nations. It is more difficult to establish just what the various stages are that Third World defense industries transit on their way to total indigenous production. Michael Moodie does a good job providing seven steps in which a Third World defense industry can progress. They are:[120]

> First, maintenance and overhaul facilities are established for the service and repair of imported arms.
>
> Second, indigenous assembly of weapons systems or other equipment under license is negotiated. At this stage, nothing is fabricated locally but imported

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[119]R.G.C. Thomas, "Defense Planning in India," p. 256.

[120]Michael Moodie, Sovereignty, Security, and Arms, The Center for Strategic and International Studies, Georgetown University, Sage Publications, Inc., Beverly Hills, California, 1979, p. 46.

knocked-down kits are fitted together in domestic plants.

Third, as indigenous assembly continues, simple components are manufactured locally under license while more sophisticated technologies such as engines and electronics continue to be imported. It is important when an industry reaches this stage, because the country can then begin to earn foreign exchange by selling components it produces either back to the licenser or to some other customer.

Fourth, the number of components produced domestically is increased until a point is reached at which it can be said the entire system is produced locally under license.

Fifth, the less industrialized arms producer makes modifications in systems in manufactures under license. Modifications can be so extensive in some cases that the licensee will claim it has made the system sufficiently different that the licensing agreement and its controls no longer apply.

Sixth, production of domestically designed and tested systems is undertaken using imported components of more sophisticated technologies.

Finally, domestically designed systems using no imported components are produced.

Moodie cautions that these are not discreet stages. In reality it is difficult to distinguish where one stage ends and the next one begins. He also points out that a nation may be in more than one stage at a time.[121]

F. THE ROLE OF TECHNOLOGY

There seems to be a common trend in all arms producing Third World nations, that is the difficulties of producing competitively advanced weapons systems due to the ever-increasing North-South technological gap. Those LDC's that have a proven and successful arms industry have been those

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[121]M. Moodie, Sovereignty, Security, and Arms, p. 46.

that one, have capitalized on upon existing industries and applied them to the military sector; and two, have imported the necessary military technology to close the technological gap.[122]

Arms trade in general supplies a significant source of technology transfer for the Third World nation. According to Arlinghaus, "The arms trade with developing nations provides an important source of technology transfer at two levels. First, the weapons themselves require the transfer of operational, technical, logistic, and managerial skills for their maintenance and employment. Second, through repair, modification, coproduction facilities developed within recipient nations, these transfers represent an additional increment of indigenous industrial capacity and infrastructure."[123]

In addition to the above-mentioned effects arms transfer has on a Third World nation's technological development, there are also the advantages that accompany reverse-engineering. There is much debate over the impact that reverse-engineering has had upon the technological development of Israel. According to Steinberg, "In analyzing the rate of Israeli technological development, some analysts have also questioned the degree to which this rapid

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[122]B.E. Arlinghaus, "Social versus Military Development: Positive and Normative Dimensions," p. 43.

[123]B.E. Arlinghaus, "Social versus Military Development: Positive and Normative Dimensions," p. 43.

evolution has been assisted by technology purchased from the USA as well as reverse-engineering and copying of weapons acquired from the USA and other sources. Raytheon, for example, claims that the Shafrir's infra-red guidance system is based on the system it developed for the US Sidewinder."[124]

There is little question that military technology transfer has its advantages for the Third World, but some scholars believe that these advantages are not as great as one might expect and not nearly as beneficial as non-military technology transfer. Arlinghaus argues this point:

> First, most military technology is nonproductive, contributing relatively little to the overall national economy of recipient nations. While some of the equipment of military forces is adaptable to civilian, civic-action, or nation-building uses, much of it is not. The growth of military forces and accompanying increases in domestic military expenditures may stimulate growth through increased demand, but may also add to the inflation. The added external foreign debt and annual debt service that arms purchases represent in scarce hard currencies add to balance of payments and other financial problems.
>
> Second, military technology is designed to be put to military uses. Even if only intended for its stabilizing, deterrent value, such technology may lead to regional arms races, increased conflicts, and its employment against the force of the supplier nation.
>
> Third, indigenous defense industries must, to operate economically, seek export markets to subsidize high initial costs and to lower the individual end-item cost for their forces. This means that there will be a continuing proliferation of arms suppliers in an already crowded and highly competitive marketplace.

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[124]G.M. Steinberg, "Israel: High-Technology Roulette," p. 169.

Fourth, because of the technology absorption problems that recipient nations experience, they either become dependent upon large numbers of "white collar mercenaries" to maintain and operate weapons systems, or send large numbers of trainees to supplier nations. These are expensive, short-term solutions to the problem, cause domestic political and economic difficulties, and are subject to phenomena such as the brain drain, the inappropriateness of training, and neocolonialism.

Finally, military technology has peculiar security aspects. The transfer of state-of-the-art equipment to developing nations may speed its compromise (in addition to the loss of proprietary information). Coproduction of or large stocks of spares and ammunition permit recipient nations to covertly avoid end-use agreements and retransfer military technology to embargoed nations. This reduces the usefulness of arms transfer and "spare-parts diplomacy" as a foreign-policy tool and suppliers may hesitate to provide the means to create such an indigenous--and therefore independent--capacity.[125]

G. SUMMARY

The reasons a Third World nation imports arms are varied. It may be in part due to the perceived threat or as a source of pride. The reasons they become arms producers may be influenced by the above along with the desire not to be dependent on outside sources for arms. This is certainly the case in South Africa and Israel. For the cases of Brazil and South Korea, profit motivation may be a factor along with the perceived threat and other variables.

In any event, technology plays an important role for the Third World arms producers. The common trend in all arms producing nations is the difficulties of producing competitively advanced weapons systems due to the

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[125]B.E. Arlinghaus, "Social versus Military Development: Positive and Normative Dimensions," p. 43.

ever-increasing North-South technological gap. Those nations that have developed a successful arms industry have capitalized firstly, upon existing industries and applied them to the military sector and secondly, have acquired the necessary military technology to close the technological gap. This is where the question of Western technology assimilated into Soviet weapons, enters. Once again the linkage between assimilated Western technology and the American national interest lies with the element of defense. The United States loses revenue and influence associated with normal technology transfer with the Third World. This loss, coupled with Soviet gains in those same areas, negatively impacts national defense, thus hindering the pursuit of the national interest.

The next chapter will address the subject of the USSR's arms trade with the Third World along with the possibility of Soviet-acquired Western technology being assimilated into the Third World's defense industries.

VII. THE SOVIET UNION: ARMS TRADE WITH THE THIRD WORLD

Arms transfer is a multi-billion dollar business and the Third World is a large contributor to the revenue that an arms exporter receives. David K. Whynes contributes the rationale for Third World defense expenditure and the reasons why it has grown, to certain factors that can be summarized as follows:[126]

1. security
2. internal repression
3. the influence of the budgetary process
4. the existence of a military-industrial complex
5. the vested interests of the military establishment
6. the needs of ideology and national identity
7. imperialism

The Soviet Union has, in the past, and still remains, a major arms supplier to the Third World. Of particular interest to this paper are those Third World nations that may have imported and license-produced Soviet weapons that may have incorporated Western technology (Appendix A).

The Soviet Union's involvement in the Third World dates back to its conception as a nation. The peoples of developing nations have been regarded in the sphere of

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[126]D.K. Whynes, The Economics of Third World Military Expenditures, p. 16.

influence of the Soviet Union because the USSR is the center of the world communist movement, and that ideological movement is guided by historical inevitability to convert the world, starting with the most pure nations, those that are not capitalist. Thus the Third World has been traditionally considered natural allies of socialism by Soviet theoreticians.[127] As Third World nations began to receive their independence from Western imperialism, Soviet doctrine modernized to support the national liberation movements and "their" quest to be independent of Western imperialistic social and economic oppression. This new tactic was adopted after Stalin's death. The Soviet Union saw the importance of the Third World because of its resources as well as a way to stop or reverse Western influence. The major difference of the post-Stalin period was that the Soviet Union could now have friendly and mutually beneficial relations with Third World nations even if they were not socialist.

Much of the Third World was receptive to Moscow's new policy toward developing nations.[128] A large percentage of this receptibility was due to the attractiveness of Soviet military assistance, the comparatively low prices for

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[127]Roger F. Paja, "The Effectiveness of Soviet Arms Aid Diplomacy in the Third World," p. 384, as presented in The Soviet Union in the Third World: Successes and Failures, Westview Press, Inc., Boulder, Colorado, 1981.

[128]R.F. Pajak, "The Effectiveness of Soviet Arms Aid Diplomacy in the Third World," p. 384.

weapons and favorable terms.[129] The going rate for a MiG-23 was $6.7 million at the time when Israel was paying about $12 million for an F-15 and the MiG-21 was selling for $2 million when the F-4 was selling for $5.7 million.[130] The financial terms included two percent interest, with repayment periods averaging 10 years, following a grace period of one to three years.[131]

A United States Department of State report estimates that since 1977 or possibly earlier, Soviet prices appear to be increasing and as of 1982 they are roughly equal or sometimes higher for similar Western weaponry.[132]

Considering prices and terms equal between the Soviet Union and the West for comparable weaponry, one clear advantage the Soviet Union offers a Third World client is the speed it can fill an arms order. This is mainly due to the capacity at which the Soviet Union arms industry runs at. Expedience is an important factor to a Third World

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[129]R.F. Pajak, "The Effectiveness of Soviet Arms Aid Diplomacy in the Third World," p. 386.

[130]R.F. Pajak, "The Effectiveness of Soviet Arms Aid Diplomacy in the Third World," p. 384.

[131]R.F. Pajak, "The Effectiveness of Soviet Arms Aid Diplomacy in the Third World," p. 384.

[132]"Conventional Arms Transfers in the Third World, 1972-81," United States Department of State, Special Report No. 102, August 1982, p. 7.

nation. It allows Moscow a significant advantage over the rest of the arms producing world.[133]

There are two clear advantages associated with every Soviet arms sale to the Third World. One is the political influence it is allowed to exercise over the buying nation and two, the hard currency it receives from the sale. The CIA estimated that the Soviet Union earned approximately $1.5 billion dollars in hard currency from arms sales in 1977.[134]

It is difficult to say how politically successful the Soviet Union's arms sales program has been but one scholar believes, "Of the various types of foreign assistance employed by the Soviets--military, economic, and technical--military aid has proven to be the most dramatic and consequential. Besides directly contributing to the emergence, growth, and survival of nonaligned regimes, arms aid has fostered an image of the Soviet Union as a benign but powerful anticolonialist power. It has served as the primary Soviet vehicle for acquiring influence in regions important to Western interests, often providing the Soviets with political entree into countries where their role had hitherto been limited or nonexistent. Furthermore, military aid has often provided the opening wedge for a variety of

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[133]"Conventional Arms Transfers in the Third World, 1972-81," p. 8.

[134]"Conventional Arms Transfers in the Third World, 1972-81," p. 7.

diplomatic, trade, cultural, and other contacts which have been difficult or impossible to achieve otherwise, such as in the Arab countries in the 1950's, India and Indonesia in the 1960's, and Ethiopia more recently."[135]

A. SOVIET ARMS TRANSFER AND WESTERN TECHNOLOGY

Whether or not a linkage exists between Soviet arms transfers to the Third World and Western technology is the main thrust of this chapter. In order to comprehensively cover this subject, it is necessary to examine specific Soviet weapons and client states, along with any Third World-produced weapons that may have been developed from Soviet weapons.

Two interesting one-time or current Third World client states of the Soviet Union are Egypt and India. The Egyptian arms industry has developed a unique know-how in regard to reverse-engineering and manufacturing of Soviet weapons.[136] This approach of reverse-engineering may partly be due to Soviet reluctance to supply Egypt with the necessary technology to produce weapons by license. The Egyptian surface-to-surface (SSM) missile program failed when the

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[135]R.F. Pajak, "The Effectiveness of Soviet Arms Aid Diplomacy in the Third World," p. 393.

[136]R. Vayrynen and T. Ohlson, "Egypt: Arms Production in the Transnational Context," p. 120, as presented in Arms Production in the Third World, edited by Michael Brzoska and Thomas Ohlson, Stockholm International Peace Research Institute, Taylor and Francis, London and Philadelphia, 1986.

Soviet Union, in the early 1970's, refused to supply the necessary guidance technology assistance.[137]

Egypt did not receive the state-of-the-art Soviet weapons. Gabriel Ben-Dor believes this to be a factor in the outcomes of past Egyptian conflicts in the Middle East. Ben-Dor argues, "The 1967 war also demonstrated the poor integration of the air force and the air-defense system, the poor serviceability of aircraft, and the other glaring weaknesses in the human and organizational structure."[138] Further he states, "In the absence of more advanced Soviet aircraft available to Egypt, a direct Soviet role in Egypt's air defense evolved, eventually creating a dense system of surface-to-air missiles that began to show its effectiveness in the dying days of the War of Attrition."[139] This indicates the Soviet Union was more willing to get directly involved in a Third World client states' conflict than transfer their front line weapons.

Beginning in 1984, Egypt started assembling an unspecified number of Chinese F-7 fighters at their Helwan factory.

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[137]R. Vayrynen and T. Ohlson, "Egypt: Arms Production in the Transnational Context," p. 117.

[138]Gabriel Ben-dor, "Egypt," p. 190, as presented in SEcurity Policies of Developing Countries, D.C. Heath and Company, Lexington Massachusetts, 1982.

[139]G. Ben-Dor, "Egypt," p. 190.

The significance there lies in the fact that the F-7 is the Chinese copy of the Soviet MiG-21.[140]

The theory that the Soviet Union exports only older generation, less technologically advanced weapons is true with the possible exception of India. Most scholars argue the Soviet Union's arms transfer relationship with India has indeed been mutually beneficial.

After India's severe failure with the HF-24 Marut fighter they adopted an arms policy of importing sophisticated weapons followed by an agreement to license and produce them. The Marut dilemma was partly the reason that India turned to the Soviet Union for arms assistance.[141] In 1960 India was the first and only non-socialist nation to negotiate a license to produce a contract with the Soviet Union. This contract called for the initial delivery of 38 Soviet-made MiG-21 fighters followed by a gradual incorporation of Indian-made components followed by full indigenous production of the aircraft. The Indian MiG-21 plant in which the Soviets supplied technical assistance and

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[140]R. Vayrynen and T. Ohlson, "Egypt: Arms Production in the Transnational Context," p. 115.

[141]H. Wulf, "India: The Unfulfilled Quest for Self-Sufficiency," p. 135, as presented in Arms Production in the Third World, edited by Michael Brzoska and Thomas Ohlson, Stockholm International Peace Research Institute, Taylor and Francis, London and Philadelphia, 1986.

machinery to build, was scheduled to close in 1985 after more than 500 aircraft were to be produced.[142]

When India was searching for a more advanced aircraft in the 1970's, they looked into the Soviet MiG-23/27, the Swedish Viggen, the Anglo-French Jaguar, and the French Mirage. All things considered, the Indian government chose the Jaguar for the possible reason to diversify supply sources.[143] India never actually bought any Jaguars. The Soviet's not wanting to lose any ground in India offered them a projected plan that would cost less than the Western one. They were allowed to pay in rupees instead of foreign exchange, at only 2.5 percent interest, over 17 years, followed by an initial seven-year grace period.[144]

India has a unique relationship with the Soviet Union. The Soviet rules regarding Third World arms exports do not seem to apply to India. Not only is India the only non-socialist country to license-produce Soviet-designed weapons, as H. Wulf argues, "While by 1984 the MiG-27 has not been flown by the Soviet Air Force, it entered service in India in late 1984. Plans for its manufacture in India include transfer of technology for making subsequent

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[142]H. Wulf, "India: The Unfulfilled Quest for Self-sufficiency," p. 136.

[143]H. Wulf, "India: The Unfulfilled Quest for Self-sufficiency," p. 135.

[144]H. Wulf, "India: The Unfulfilled Quest for Self-sufficiency," p. 136.

versions, especially the MiG-29 and possibly the MiG-31 which is still in the design stage. It is reported that India has already placed a firm order for the MiG-29."[145]

B. SUMMARY

Arms trade with the Third World is very important to the Soviet Union (Appendix B). It yields a source of hard currency; allows the Soviets to exert "spare parts diplomacy" upon their client states, and possibly more importantly it allows them access to strategic regions they would not previously have.

As mentioned earlier in this paper, there are indications that Western technology is incorporated in much of Soviet weaponry, from look-down, shoot-down radars to missile technology.

It would be safe to conclude that the Soviet Union is benefiting twice from acquired Western technology. First, by the initial assimilation of technology and the advantages of using the systems that incorporate that technology, and second, by the advantages associated with Third World arms trade as stated above. On the other hand, as seen in the case of India, the Third World partner is also benefiting from the same technology in that it not only uses the product but it also can utilize the Western technology in

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[145]H. Wulf, "India: The Unfulfilled Quest for Self-sufficiency," p. 135.

its own defense industry via license or eventual indigenous production.

The next chapter will examine the question of a grand technology strategy along with Eastern technology and its worth to the West.

VIII. THE QUESTION OF TECHNOLOGY TRANSFER

Charles Wolf delineates the question of technology transfer into three main sections--the security, political, and economic aspects thereof.[146] Each of these aspects will be covered for clarification purposes. They are:

Security--The security aspects of technology transfer are concerned with technology that will enhance Soviet military capabilities.

Political--The political aspects of technology transfer refers to the relaxing of controls that further encourage technological export for the purpose of hoping to ease political tensions, and somehow manipulate Soviet behavior in a favorable manner. What are political gains--is usually a question that has a very subjective answer in which everyone is their own expert.[147] It all boils down to comparing the release of a Soviet dissident to the sale of a microcomputer, which is more valuable in regard to the national interest.

Economic--The economic aspects of technology transfer refer to the potential economic gains for U.S. exports if controlled markets are opened. Wolf argues that, "The gains are likely to be modest: modest, though not negligible. . . ." He further contests, in regard to high technology exports to the USSR, "we should be more concerned with what we can get in return than with whether to relax controls."[148]

Wolf has one solution to the question of technology transfer. The United States should: one, "identify those

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[146]C. Wolf, "Soviet Economic Stringencies: External Reactions and Repercussions," p. 2.

[147]C. Wolf, "Soviet Economic Stringencies: External Reactions and Repercussions," p. 3.

[148]C. Wolf, "Soviet Economic Stringencies: External Reactions and Repercussions," p. 2.

cases in which we can benefit from Soviet technology; and two, facilitate technology impact in those cases."[149] He concludes that technological trade with the Soviets is not bad. The United States should negotiate to get more current payment, instead of deferred payment through buy-back arrangements; greater incentives for the Soviets to dig into their gold stocks; and higher prices for what is exported.[150]

Wolf made the statement that the United States should be more concerned with what it gets in return. The possible trade of U.S. technology for Soviet technology may be one of these returns. The next few paragraphs will examine that question.

A. THE DESIRABILITY OF SOVIET TECHNOLOGY

The West should not tip its nose up at Soviet technology. According to J. Wilczynski, "The USSR is a recognized leader in the technology of automatic and semi-automatic welding, the blast furnace smelting of iron ore, the electrolytic extraction of zinc, magneto-hydrodynamic and turbo generators, fast-breeder reactors, thermonuclear fusion, the high-voltage long-distance transmission of

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[149]C. Wolf, "Soviet Economic Stringencies: External Reactions and Repercussions," p. 4.

[150]C. Wolf, "Soviet Economic Stringencies: External Reactions and Repercussions," p. 6.

power, stereoscopic color . . . "[151] These are some examples. The list goes on.

American industry has found use for Soviet technology. Both General Electric and General Motors have purchased Soviet electronic and computer components.[152] Another example supporting the utility value of Soviet technology to the United States can be seen by Soviet licenses purchases by American firms. Some of these include:

Soviet Licenses Purchases by US Firms

American Home Products	Pharmaceutical drug "pyroxam"
Chemetron	Continuous welding electrodes
Reynolds Metals	Casting of Aluminum ingots
Texas Utilities Services	Underground gasification of lignite
Universal Oil Products	Tube reducers

The socialist market is open from their vantage point. Wilczynski believes that Western technology is very important to them not only because they earn hard currency but because of the psychological and political rewards they

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[151]J. Wilczynski, "The East-West Technology Gap and the Reverse Flow of Technology," Acta Oecomomica, 15, 1975, p. 297.

[152]J. Wilczynski, "The East-West Technology Gap and the Reverse Flow of Technology," p. 299.

believe they reap, i.e., showing the superiority of socialism.[153]

Wilczynski's findings support Wolf's theory in that he shows there to be desirable Soviet technology and that they are willing trading partners. Soviet technology might be one more thing the United States could get in return. Although, Stefan Possony and J.E. Pournelle have a different approach to the question.

B. TECHNOLOGY AND STRATEGY

Technology is undoubtedly a key force in the development of U.S. defense strategy. Weapons technology may be the most important factor that drives national security affairs. The ability to defend the interests of the United States is utmost. Weapons technology is the tool that enables this defense. It is the driving force today, in that it dictates strategy and in most instances, foreign policy.

No other component of national security affairs can alter the strategic balance as does weapons technology. An example of this was the atomic bomb and later the hydrogen bomb and the ICBM. It was technology driving technology at perpetual motion proportions. Technology can account for justification for disparity of numbers. This is certainly the case when comparing NATO with the Warsaw Pact.

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[153]J. Wilczynski, "The East-West Technology Gap and the Reverse Flow of Technology," p. 304.

Wolf's argument on technology transfer was to trade smart, that is get the most from the Soviets while not adversely affecting the United States' national security. Possony and Pournelle have a different idea.

Possony and Pournelle believe that the United States is in a technological war with the Soviets, a war it should fight to win.[154]

1. The Technological War

Possony and Pournelle, in their book, The Strategy of Technology: Winning the Decisive War, stress that America should realize its strengths and build upon them. They contest, "America's main chance is to trust ourselves instead of our enemies, to remain stronger and to be more effective builders of peace than our foes. Technology is America's manifest destiny."[155] They further argue, "The United States is at war. Whether we consider this to be the Protracted Conflict initiated in 1917 by the Bolsheviks or something new brought about by the march of technology in this century, the war is taking place and it cannot be escaped. The field of engagement is not everywhere bloody. Except for financial sacrifices, many citizens of the West and subjects of Communism may be unaware that the conflict

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[154]Stefan T. Possony and J.E. Pournelle, The Strategy of Technology: Winning the Decisive War, University Press of Cambridge, Massachusetts, 1970, p. 1.

[155]S.T. Possony and J.E. Pournelle, The Strategy of Technology: Winning the Decisive War, p. xxxii.

has been going on until the decision moment, if it ever comes, is upon them. For all that, the Technological War is most real, and we must understand its nature. Our very survival depends upon not losing in the technical arena."[156] It is imperative to define the kind of warfare fought in a Technological War. The authors define it this way: "technological warfare is the direct and purposeful application of the national technological base and of specific advances generated by that base to attain strategic and tactical objectives."[157] The technological base refers to the sum total of resources needed to produce and constantly modernize the tools of war and peace, including scientists, inventors, engineers, laboratories, laboratory equipment, funds, information flow, incentives, etc., as well as industry and the economy as a whole.

J. Fred Bucy concurs with the importance of technology to America's future. He suggests, "The United States and its Western allies . . . rely on America's technological superiority as an offset to the Soviets' quantitative military power."[158] Bucy also agrees that maintaining America's technological superiority is vital to the national

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[156]S.T. Possony and J.E. Pournelle, The Strategy of Technology: Winning the Decisive War, p. 1.

[157]S.T. Possony and J.E. Pournelle, The Strategy of Technology: Winning the Decisive War, p. 4.

[158]J.F. Bucy, "Technology Transfer and East-West Trade: A Reappraisal," p. 202.

security, but he stresses a problem with security, "this goal of security has been jeopardized by both the increased proliferation of technology in general and the lag between the development of a technology and its application to weapons systems."[159]

Opponents to Possony and Pournelle might say that to really attempt to win the Technological War might either trigger an arms race or offset the balance of power to the extent as to make the world order unstable. The authors would counter by saying that an arms race is an alternative to destructive war, not the cause of military conflict and that the United States had clear strategic superiority in the late sixties and early seventies that did not provoke war.

There is an end to the Technological War. "Victory in the Technological War is achieved when a participant has a technological lead so far advanced that his opponent cannot overcome it until after the leader has converted his technology into decisive weapons systems. The loser may know that he has lost, and know it for quite a long time, yet be unable to do anything about it."[160]

The authors recognize the political difficulties of defense versus social spending issues. But they insist,

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[159]J.F. Bucy, "Technology Transfer and East-West Trade: A Reappraisal," p. 202.

[160]S.T. Possony and J.E. Pournelle, The Strategy of Technology: Winning the Decisive War, p. 12

"Security has always been and will remain the primary task of statecraft . . . however . . . supporting other issues, such as ecology, urban renewal, etc., makes one more popular."[161] They stress that the main problem with the Technological War is not technology, which can operate in all areas, but the fact that politicians are voted for because they possess personality even though they greatly lack insight to solve the problems of the times.[162]

It is quite obvious that the United States has a clear advantage in technological capabilities, but it had a clear strategic superiority at one time also. The United States has many problems to contend with in fighting the Technological War, such as the ad hoc nature of America, budgetary/domestic constraints, etc., and no Technological War strategy. The latter-mentioned problem is absolutely a necessity in order to obtain final victory. It is believed the Soviets have a technology strategy, and obtaining American technology is part of it. Due to the open nature of American society, it would virtually be impossible to prevent the Soviet Union from obtaining technology illegally, and through clandestine means, although it could be made more difficult. Possony and Pournelle did not address the issue of technology transfer, but one probably

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[161]S.T. Possony and J.E. Pournelle, The Strategy of Technology: Winning the Decisive War, p. xxiii.

[162]S.T. Possony and J.E. Pournelle, The Strategy of Technology: Winning the Decisive War, p. 12.

would be safe to say that they would protest trading with any enemy in any war.

C. SUMMARY

The Soviet Union is a recognized leader in many areas of technology. These tend to apply more towards the civilian sector of the United States than the military. For this reason the U.S. probably would encounter a net loss in security by exchanging technology with the Soviet Union. The United States as the world technological leader could only stand to lose ground to the Soviet Union by any technological trade arrangement. This does not mean that the United States should eliminate the notion of transferring technology to the USSR. As part of a technological grand strategy, along the lines of that proposed by Possony and Pournelle, in the future it may be appropriate to allow certain Western technology to be exchanged in return for equally-weighted Eastern technology.

Possony and Pournelle emphasize the importance of technology to America's future. They strongly advocate a development of a technological strategy that will ensure the defense of this nation. For them the United States is in a technological war with the Soviet Union. They may agree that space is a battlefield and Star Wars is a battle in motion. The technologically superior nation does not always win the battle. The Soviet Union could win the Star Wars

battle if they or some other entity persuades the U.S. to cancel SDI research.

IX. CONCLUSION

This study set out to define an operational definition of the national interest that can be used by policy-makers when formulating technology transfer policy and to examine five hypotheses that relate to technology. The national interest was defined in the following way: in brief it is an instrument of political action in that it is a means of justifying, denouncing, or proposing policies. It is the protection of our perceived needs and desires, i.e., the national identity and core values that make up the essence of what America is. These include the Declaration of Independence, the Constitution, the Bill of Rights, and the 10th Federalist Papers.

While researching the national interest, two revelations began to take hold. First, in order to protect the national interest, America's number one goal must be to maintain a strong national defense. It is only from a strong strategic position that the United States can hope to negotiate other interests such as world peace, human rights and the spreading of world democracy and freedom. Second, America's security is paramount to the pursuit of the American Dream. Therefore the national interest should take priority over the public interest or economic interests. Foreign and domestic policy should be formulated with defense in mind.

A strong defense is key to obtaining both national and public interest goals.

The first hypothesis is accepted, how one views the Soviet Union directly affects one's perceptions towards the imperativeness of the linkage between technology and U.S. security. Whether one adheres to the mirror-image or power-maximizing approach toward the Soviet Union directly affects one's views on the importance of technology to U.S. security. The results of this hypothesis will be addressed later in this conclusion.

The second hypothesis is also accepted. Technology is a vital element of U.S. national security. Technology is linked to security because of its strategic significance. As long as U.S. strategic doctrine is based upon the possessed technological advantage its weapons have over the Soviets, and as long as strategic doctrine dictates "a come as you are war," the importance of technology to U.S. security can not be overemphasized.

The third hypothesis is accepted also. The Soviet Union greatly benefits from the Western technology it receives, either overtly or through illegal means. The Soviet Union has been very successful in acquiring Western technology by a combination of legal and illegal means. Legally the Soviets acquire Western technology through open literature, legal trade channels, and student, scientific, and technical exchange programs. On the illegal side, there is a major

and increasing problem of the most advanced Western technology being acquired by clandestine means.

The fourth hypothesis, Western technology positively impacts Soviet economic growth, is rejected. There is little evidence that Western technology significantly affects Soviet economic growth. Soviet investment in Western technology is rather small, and total impact on the Soviet economy is modest.

The fifth hypothesis was an attempt to link the benefits of Soviet acquired Western technology to the Third World. It stated that the Soviet Union benefits twice from acquired Western technology--first from the initial incorporation, and second from the advantages associated with transferring those goods to a Third World client. Logical deduction says this hypothesis is valid, although there is little empirical data to support it.

One may champion the notion that the USSR only exports its less sophisticated weapons to the Third World, therefore the chances of these weapons, even if they have had Western technology assimilated into them, have little significance on Western security.

It is generally true that the Soviet Union transfers its less than state-of-the-art equipment to the Third World. But one must consider the fact that the Soviet Union's earlier generation aircraft (such as the MiG-21 and MiG-23)

fire the AA-2 Atoll air-to-air missile, a missile that was derived from Western technology. This weapon is in the arsenal of several Third World nations. Every nation that uses the Atoll missile is benefiting from Western technology.

One would logically have to assume that much more Western technology was assimilated into the Soviet weapons that are exported to the Third World. Therefore the Soviet Union is benefiting monetarily through the hard currency it receives for the weapons as well as politically. This same currency may in turn be used to finance the acquisition of more Western technology as well as other defense-related projects. One can also deduce that the Third World client state benefits from Western technology in addition to the inherent value of the product it buys.

The research associated with this hypothesis led to the question being asked--does the Third World nation, by its own indigenous production, benefit from Western technology that is assimilated into Soviet designs it copies? There were no facts found that substantiate a yes reply to that question, although the case of India may apply.

India is an exception to the rule in so much as the Soviet Union's policy towards Third World arms transfers is concerned. India is the only non-socialist nation that the USSR allows to license-produce Soviet weapons.

Generally, the Soviets do not export their most modern weapons. This may not be true as far as India is concerned. The Soviet Union has plans to export its latest generation aircraft to India. This indicates one, that the Soviets are willing to export advanced aircraft to India , and two, they are willing to export these aircraft while simultaneously fitting their own forces. This is unprecedented in regard to Soviet arms transfer policy and the Third World. It is equally significant because this generation of aircraft contains assimilations of the F-15 look-down, shoot-down radar and possibly a like F-14 Phoenix air-to-air missile. These systems represent the latest in Soviet technology as well as the latest in U.S.-employed technology at this writing. This of course assumes that the Soviet Union will give India the full avionics (air intercept radar) package and not a modified export version which it has historically done in the past.[163] If this proposed arms deal materializes for India, they will benefit from the latest Western technology and best financial terms the Socialist world can offer. Only time will tell what the political concessions the Soviet Union will receive in return.

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[163]Other nations are slated to receive the MiG-29. For example, Iraq reached an agreement with the Soviet Union to buy the MiG-29 on August 1984. The quantity, cost and expected delivery dates are unknown. The difference between Iraqi and Indian agreements with the USSR is that India license-produces Soviet weapons and Iraq does not.

One formidable conclusion arrived at from the exploration of the above hypotheses is that technology is extremely important to the security of both the United States and the Soviet Union. The question of technology and technology transfer should be of grave concern to both nations. On the political side of technology transfer, mirror-imagizers will argue that trade with the Soviet Union contributes to a more peaceful world order. The power-maximizers would disagree. They contend that detente was a futile effort as can be seen by the Afghanistan invasion. They believe Soviet acquisition of Western technology is the result of a well thought out strategy.

Both of these approaches have their faults. The mirror-imaging approach can be likened to an ostrich with its head in the sand, and the power-maximizing approach tends to be over-aggressive in nature. The more prudent approach to the issue would be not to adopt either approach because both are defense oriented, but to take an offensive approach to the issue of technology transfer. The main stumbling block confronting an offensive approach to the issue of technology transfer is that there is no U.S. technology strategy. There are no real defined goals and objectives. The nation's greatest potential strategic advantage over the Soviets is left to the whim of fate. So, the first step towards answering the technology transfer question is to

recognize this deficiency and develop a long term technology strategy that addresses the issue. This will not be easy.

U.S. decision-makers tend to seek the lost idealism of the American pragmatic period, and this is not all bad, but the quest is reflected in certain delusions concerning technology transfer. They tend to want to favor the political or economic side of technology transfer instead of promoting long term security. Whether a policy-maker hears Gustafson's severe warnings or Miller's mild cautions, he has a moral obligation to make the prudent choice and adjust policy accordingly. If in doubt it is better to error on the conservative side. The Soviets are not going to break off diplomatic relations with the United States because of a policy of no technology trade if that is what U.S. technology strategy dictates.

The second step is to tighten up on Soviet covert operations as much as possible. Make things hard for them. This is equally as difficult considering the open society America is, but it also can be an objective of America's technology strategy.

Specifics of what the technology strategy should consist of is a study in itself, but it may include bargaining for useful Soviet technology. What it must <u>not</u> allow is trading away technology for a mere handful of tokens as was done many times in the past.

The key to developing a technology transfer policy that is in keeping with the national interest lies in developing a technology strategy. The strategist must look between the metaphysical and the empirical, the strategy lies there. It must be long term and futuristic. Once the strategy is created, the policy-maker can implement it in an idealistic manner because it does not have to yield immediate results. The policy-maker can then positively quest for the traditional American pragmatic philosophy and with any luck America could win the technological war before the Soviets have a chance to counter. At the very least, American technology transfer policy and the national interest must be united.

APPENDIX A

DELIVERIES OF MAJOR ARMS EXPORTERS, 1981-1984

	Distribution (%)		Ratio to deliveries in 1973-76	
	To World	To Developing	World	Developing
Total, all exporters	100.0	100.0	2.6	2.9
Soviet Union	28.4	31.7	2.2	2.9
United States	24.6	17.4	1.7	1.2
France	10.7	12.9	4.1	5.7
United Kingdom	5.2	5.3	3.1	3.3
West Germany	4.3	4.6	4.2	4.2
Italy	2.9	3.4	4.2	4.6
Other Warsaw Pact	7.0	5.5	3.1	5.5
Other NATO	2.5	2.6	2.5	3.9
Other communist	5.6	6.9	5.9	5.9
Other non-communist	8.9	9.7	6.9	8.3

Source: World Military Expenditures and Arms Transfers 1985, U.S. Arms Control and Disarmament Agency

APPENDIX B

VALUE OF ARMS TRANSFERS AND TOTAL IMPORTS AND EXPORTS, 1973-1983

YEAR	ARMS IMPORTS[a] Million dollars		ARMS EXPORTS[a] Million dollars		TOTAL IMPORTS[b] Million dollars		TOTAL EXPORTS[b] Million dollars		ARMS IMPORTS / TOTAL IMPORTS %	ARMS EXPORTS / TOTAL EXPORTS %
	Current	Constant 1982	Current	Constant 1982	Current	Constant 1982	Current	Constant 1982		
SOVIET UNION										
1973	220	431	5300	10395	20980	41151	21332	41842	1.0	24.8
1974	210	378	4100	7395	24861	44841	27374	49374	0.8	15.0
1975	300	496	4000	6616	37070	61313	33407	55254	0.8	12.0
1976	500	782	5300	8293	38212	59797	37269	58321	1.3	14.2
1977	750	1108	6600	9755	40926	60490	45227	66847	1.8	14.6
1978	1100	1513	7700	10596	50798	69908	52435	72161	2.2	14.7
1979	1000	1268	12500	15860	57958	73537	64913	82362	1.7	19.3
1980	910	1059	11600	13509	68473	79743	76437	89018	1.3	15.2
1981	685	729	11200	11931	73158	77936	79377	84562	0.9	14.1
1982	685	685	11300	11300	77847	77847	87168	87168	0.9	13.0
1983	1150	1103	9800	9402	80440	77174	91648	87927	1.4	10.7

Source: World Military Expenditures and Arms Transfers 1985, U.S. Arms Control and Disarmament Agency

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